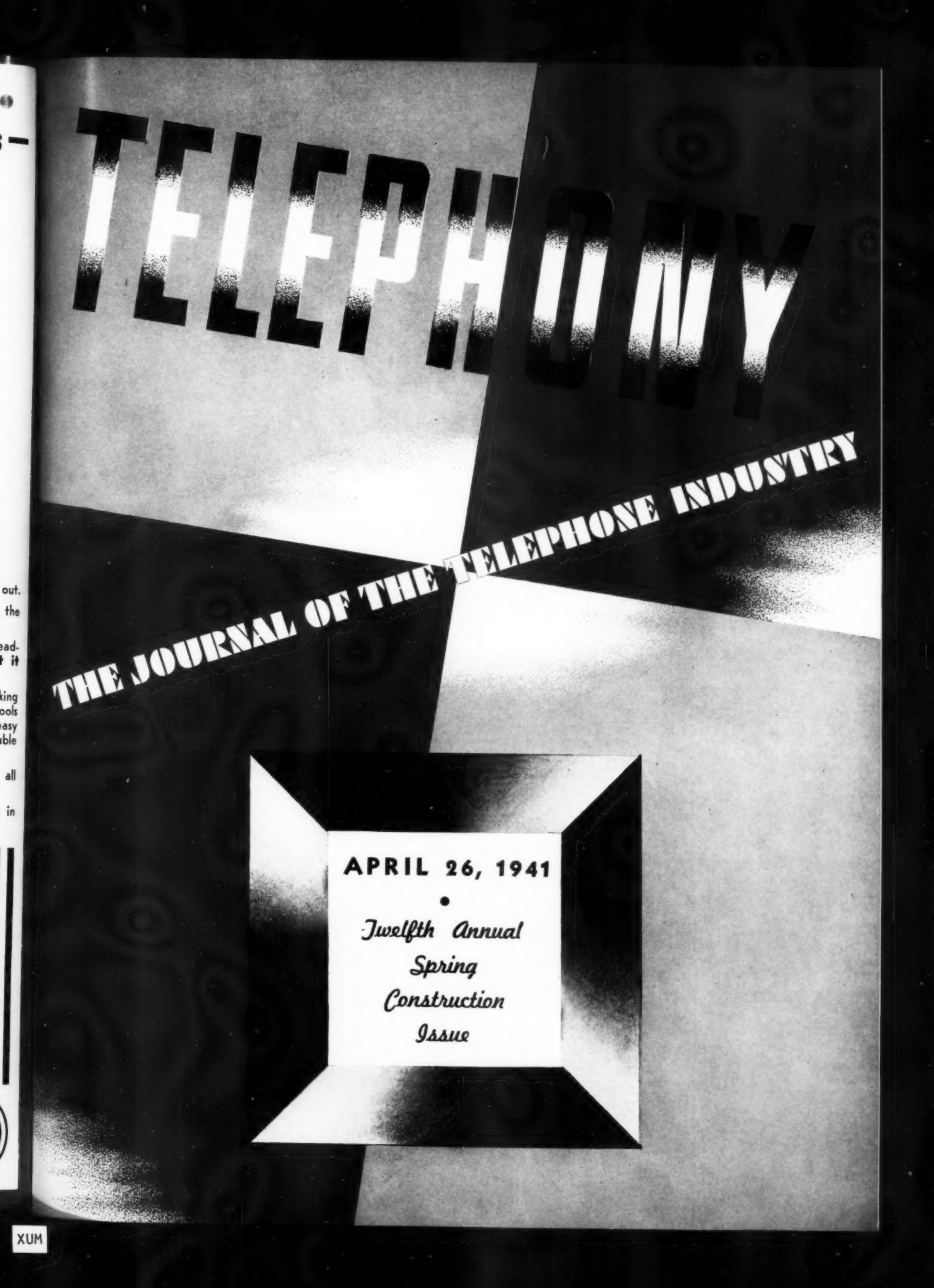
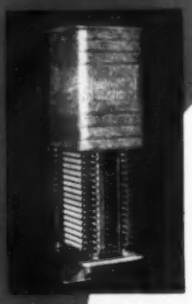
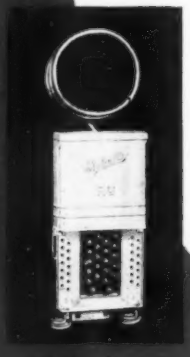
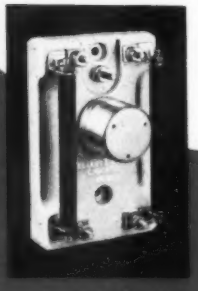

TELEPHONY
THE JOURNAL OF THE TELEPHONE INDUSTRY
APRIL 26, 1941
Twelfth Annual
Spring
Construction
Issue



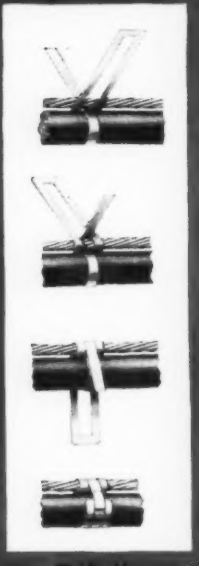
E-27 Protected Cable Terminal



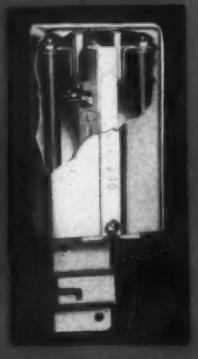
RU Unprotected Cable Terminal



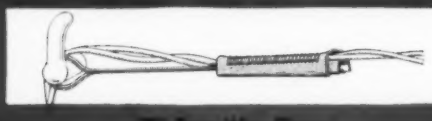
No. 955 Station Protector



Zinc Cable Hangers



No. 1000 Outdoor Protector



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Crapo HIGH TENSILE TELEPHONE LINE WIRE
COMPARE THE SPAN LENGTHS!
SIZE NO. 12 B.W.G. HEAVY LOADING DISTRICT
Crapo HTL-135
SPANS TO 350 FEET
Crapo HTL-85
SPANS TO 225 FEET
B.B. GRADE
SPANS TO 150 FEET
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NEW long-span, low-cost rural lines today are bringing increased revenues to telephone exchanges all over the country.

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Write today for Technical Bulletins No. 201 and No. 202 containing pertinent engineering data and valuable construction practice information.

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SPEEDIER SHIPMENTS

FINEST QUALITY AT RIGHT PRICES

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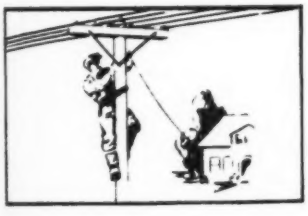
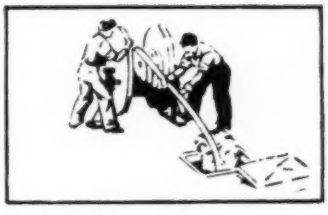
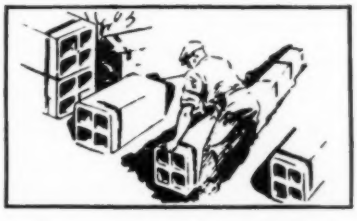
BORDER TO BORDER







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It's nice to deal with a company that you can DEPEND ON. It's good to know that your orders will be shipped promptly, when and where you want them. Send your orders to Kellogg and know that you're getting the highest quality, pre-tested, DOUBLY GUARANTEED materials at fair prices.

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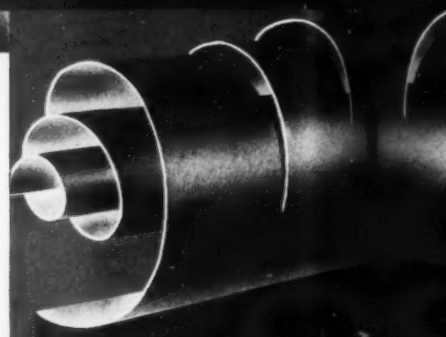

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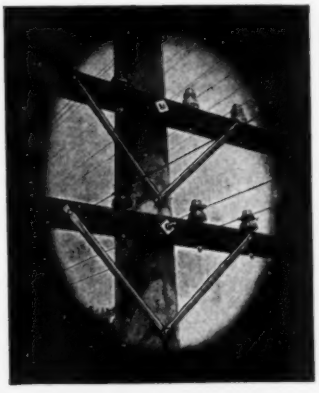

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Joslyn Pole Line Hardware stands up under the worst weather conditions. It is not affected by time—a coating of pure zinc protects it against rust and corrosion. Joslyn products are built to meet a standard—not a price. Complete stocks are carried at warehouses throughout the country to assure you fast, efficient service at any time, anywhere.

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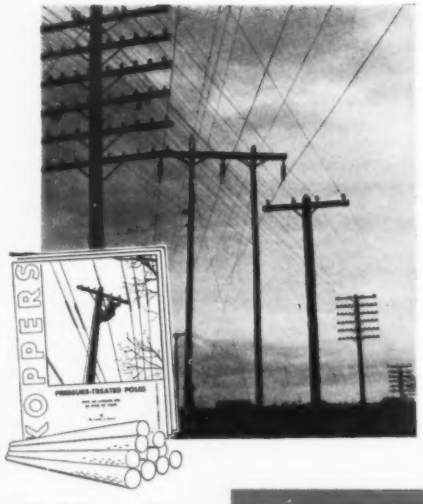
Crapo HTL-85 High-tensile, Low-resistance Telephone Line Wire permits spans to 225 feet in heavy loading districts . . . cuts costs on new construction . . . provides stronger spans, with less maintenance, on existing lines. **Crapo HTL-135,** of still greater tensile strength, permits spans to 350 feet in heavy loading areas . . . reduces number of pole structures . . . makes line extension more economical and profitable. Write for Indiana Bulletins No. 201 and No. 202.

Control



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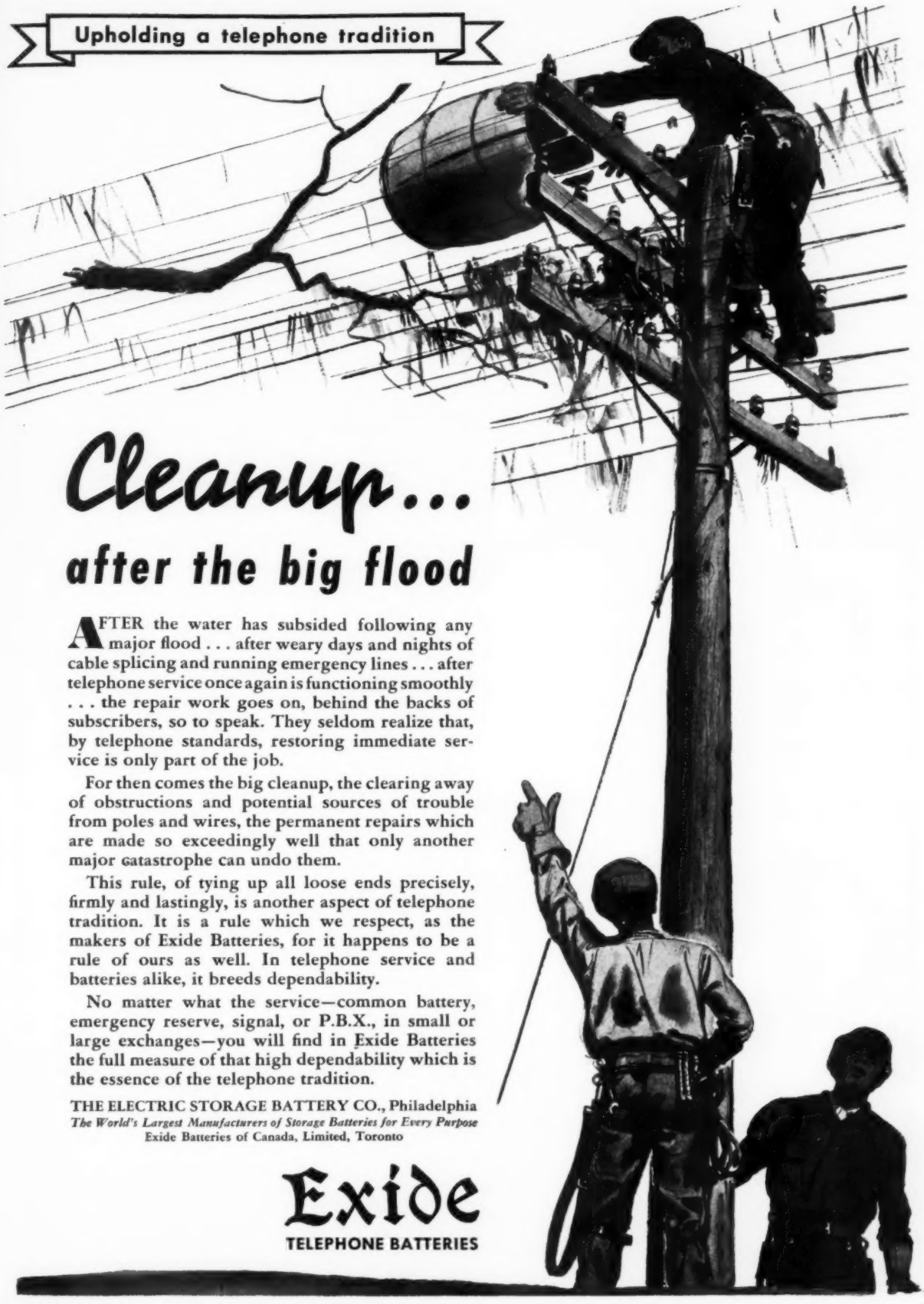

Cleanup...

after the big flood

AFTER the water has subsided following any major flood . . . after weary days and nights of cable splicing and running emergency lines . . . after telephone service once again is functioning smoothly . . . the repair work goes on, behind the backs of subscribers, so to speak. They seldom realize that, by telephone standards, restoring immediate service is only part of the job.

For then comes the big cleanup, the clearing away of obstructions and potential sources of trouble from poles and wires, the permanent repairs which are made so exceedingly well that only another major catastrophe can undo them.

This rule, of tying up all loose ends precisely, firmly and lastingly, is another aspect of telephone tradition. It is a rule which we respect, as the makers of Exide Batteries, for it happens to be a rule of ours as well. In telephone service and batteries alike, it breeds dependability.

No matter what the service—common battery, emergency reserve, signal, or P.B.X., in small or large exchanges—you will find in Exide Batteries the full measure of that high dependability which is the essence of the telephone tradition.

THE ELECTRIC STORAGE BATTERY CO., Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Exide
TELEPHONE BATTERIES

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that save time...cut costs...

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Provides new convenience in testing signal, control and electronic circuits. Has 27 voltage, current and resistance ranges. High sensitivity for testing photo-cell, vacuum tube and relay circuits, and other plant maintenance and production requirements.

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For checking commercial radio tubes used in telephone circuits. Tests tubes with filament voltages ranging from 1½ to 117 volts. Provides short check and cathode leakage test. Operates on 110 volt AC. Compact, light weight.

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A complete line of AC and DC panel meters in all standard sizes and shapes, and all range requirements. Standard throughout the telephone industry because of their unequalled dependability.

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A complete line of sensitive relays (indicating and non-indicating types) . . . time delay relays . . . and supplementary power relays. Sensitive relays to operate at energy levels as low as 1 millivolt or 2 microamperes. Handle 50 milliamperes at 110 volts on contacts.

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WESTON *Instruments*

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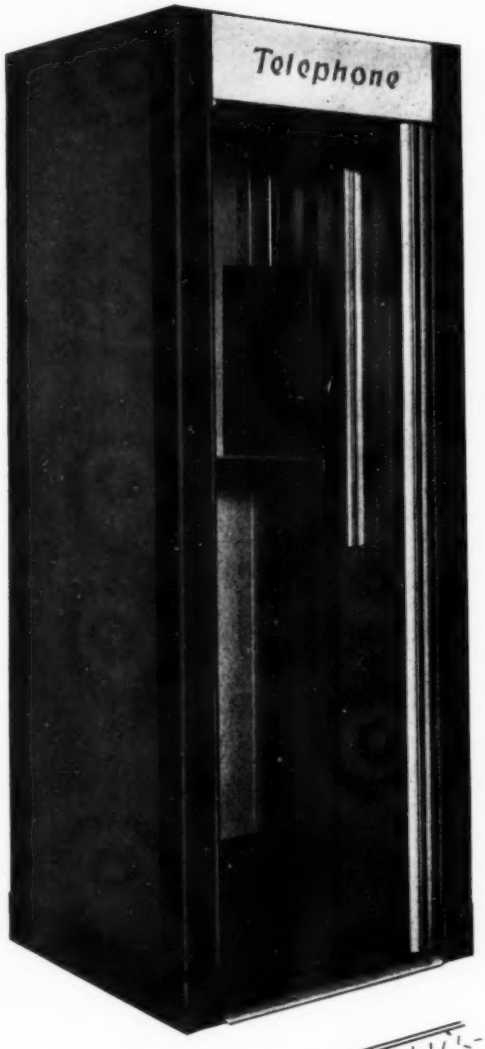
Announcing the

ACOUSTIC STEEL TELEPHONE BOOTH



A practical step forward in telephone booth design. All-steel construction. Acoustically treated inside linings with sound absorbing material.

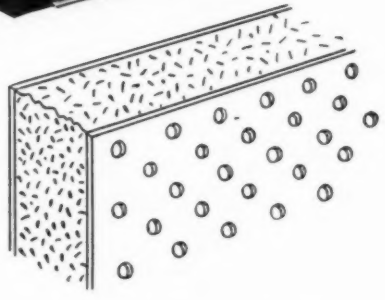
OTHER FEATURES INCLUDE:

EQUAL LEAF FOLDING DOOR
ADJUSTABLE SHELF
ELECTRIC VENTILATION
ELECTRIC LIGHT
RIGID CONSTRUCTION
WIRING FACILITIES
REMOVABLE SEAT
RUBBER TILE FLOORING
STAINLESS STEEL TREAD
BAKED ENAMEL FINISH IN COLORS
STAINLESS STEEL LININGS AND BASE AVAILABLE AT EXTRA COST

WHY PAY MORE—WHY ACCEPT LESS!

Outside Booth Dimensions
30" wide x 30" deep x 83¾" high

U. S. AND FOREIGN PATENTS PENDING



Section of wall panel showing acoustic material and perforated lining. Sounds entering booth pass through thousands of small holes and are absorbed by acoustic material.

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"STANDARD UNDERGROUND" CABLE—costs less "per year of service" due to its longer life.

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"HEMINGRAY" AND "WHITALL TATUM" INSULATORS—recognized high-quality products available in every size and style.

"SANDS" PROTECTION EQUIPMENT—insures complete protection from dangerous currents of every type.

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Tune in "The Telephone Hour" each Monday night at eight o'clock, E.S.T. We believe you will enjoy it. As you listen, notice how radio offers another means of informing people about the telephone service of this country. These friendly messages should benefit the whole telephone industry.

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★ FRANCIA WHITE, Soprano

★ DONALD VOORHEES and the

★ BELL SYMPHONIC ORCHESTRA and CHORUS

EVERY MONDAY

N.B.C. RED NETWORK

THE BELL TELEPHONE SYSTEM

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RINGS For Hanging Cable

For ease, speed, security and convenience in hanging cable, National Rings can't be beat. Because of the simple, clever "Handy Five Clusters" they handle easily and there's no hooking together in carton or linemen's pail. Once placed they "stay put"; there is no slipping along or jumping off messenger.

If there's a second cable to be hung, you can save a lot of time and material by using National Extra Long Rings, designed especially for hanging an extra cable on existing strand. No matter what your cable hanging job, you'll do it best with National rings. Order today from your jobber.

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Get Rid of Noise!

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New Improved RTC-2 VINCENT

RARE GAS RELAY

- *Installed in a Minute*
- *No Moving Parts*
- *Thousands in Service*
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Eliminates unbalance noises in metallic party lines employing divided ringing to ground. Works with either harmonic or code ringing.

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TELEPHONY

The Journal of the Telephone Industry

April 26, 1941 **Vol. 120, No. 17**

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SUBSCRIPTION—10 Cents a Copy; $3 a Year U. S., Cuba and Mexico; $4 Canada; $5 Other Countries

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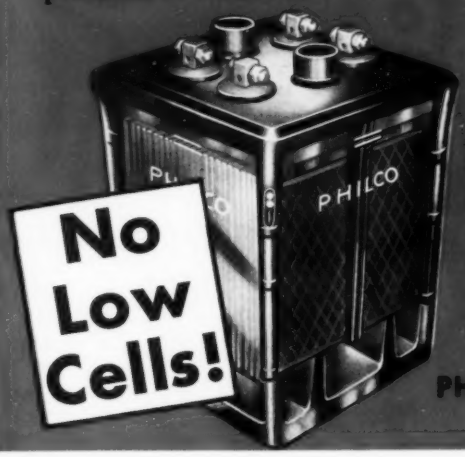

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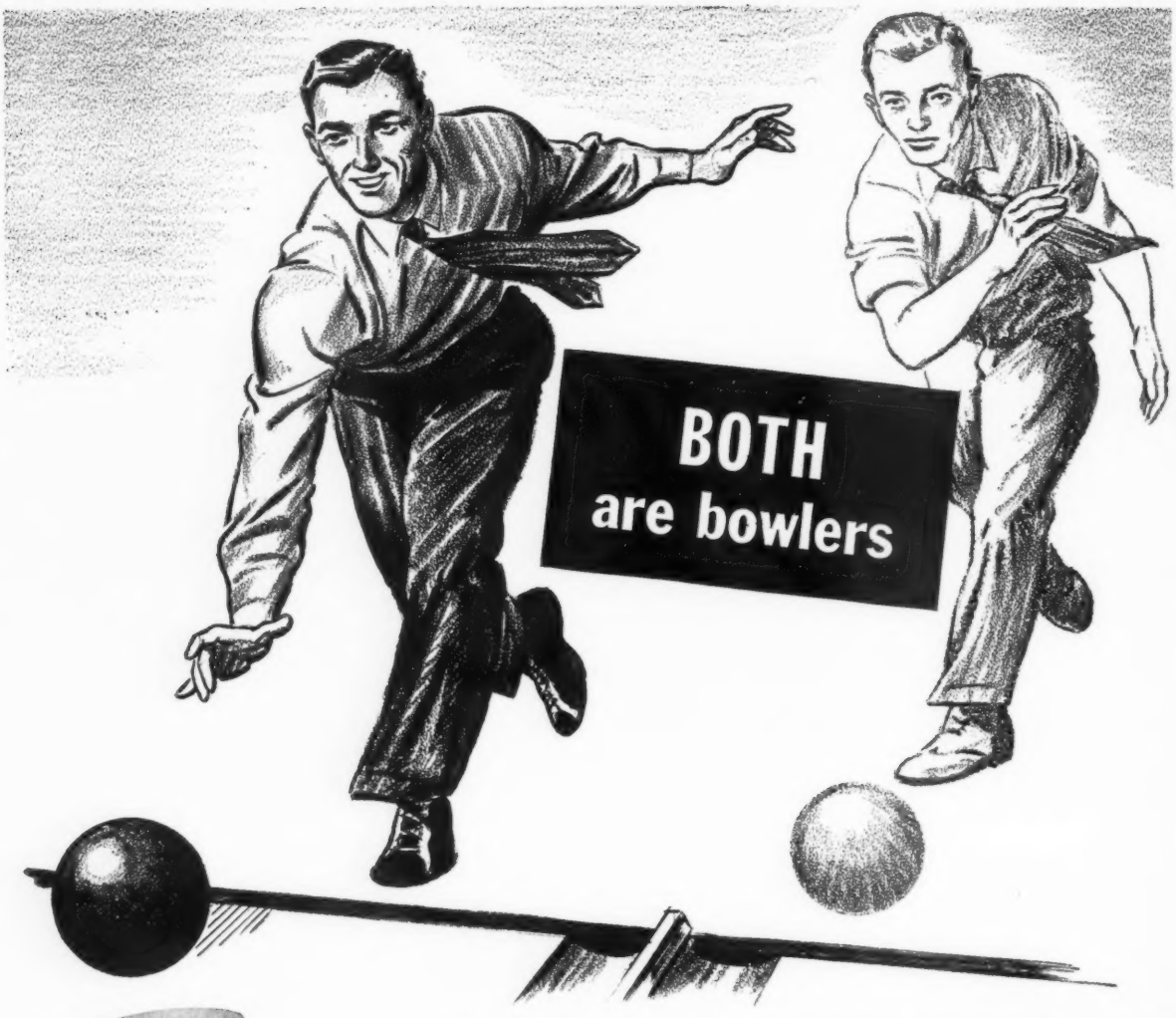

Developed and constantly improved *in the world's largest dry battery laboratory, "Eveready" "Columbia" "Gray Label" Long Life telephone cells give rock-bottom economy. It pays to specify them. Available at leading telephone supply distributors.*

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Performance makes the difference!

A champion bowler must deliver consistent, precise performance. And the same is true of telephone dry cells.

Users have found that *precision built* "Eveready" "Columbia" "Gray Label" Long Life telephone cells have the *stamina* to give top-flight service life. Their voltage is sustained *longer*, improving transmission, and providing more usable power per penny invested.

Consistently uniform . . . made to one standard of high quality . . . these cells are the choice of more independent telephone companies than any other brand!

CHAMPION FOR THREE REASONS

- ★ **Longer Life**
- ★ **Sustained Voltage**
- ★ **Uniform Quality**

NATIONAL CARBON COMPANY, INC.
General Offices: New York, N. Y.
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Unit of Union Carbide and Carbon Corporation
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The words "Eveready", "Columbia" and "Gray Label" are trade-marks of National Carbon Company, Inc.

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HIGHEST QUALITY . . . ?
MINIMUM REPLACEMENT . . ?
PROMPT SHIPMENT . . . ?

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A 46-Year Record For Unsurpassed Quality

For 46 years, the Stromberg-Carlson Telephone Manufacturing Company has been furnishing operating companies with the many construction materials and supplies they need for construction and maintenance work. During this long period of time, the supplies included in the Stromberg-Carlson line have been of the same high quality that identifies products made by Stromberg-Carlson. Before being put into the line, the construction materials and supplies which Stromberg-Carlson sells are subjected to just as rigid engineering tests as the company gives to apparatus of its own manufacture. That is why making Stromberg-Carlson your source of supply will mean the highest type of material and the lowest maintenance cost.

STROMBERG - CARLSON TELEPHONE MANUFACTURING COMPANY
Factory and General Offices: 100 Carlson Road, Rochester, N. Y., U. S. A.
Branch Offices: Chicago, Kansas City, San Francisco, Toronto

HABIRSHAW No. 17 BRONZE DROP WIRE

The conductor is a special high tensile strength alloy. It is insulated with a rubber compound of strong mechanical and high electrical characteristics, designed to resist oxidation caused by exposure. To further prolong the life of this rubber insulation, a closely woven cotton braid of highest quality double ply cotton yarn is used. This braid is impregnated with an asphalt saturator that thoroughly penetrates every fiber of the cotton and is finished with a special pitch compound to seal out the destructive agents, moisture and air.

CRAPO HTL-85 HIGH TENSILE TELEPHONE LINE WIRE

(Crapo Galvanized)

Telephone companies can now lower construction cost, reduce maintenance expense and improve service by using this low resistance line wire for long-span rural lines. It makes possible spans of 225′ in heavy, 325′ in medium, and 375′ in light loading districts and provides stronger, safer spans on existing pole structures. Its superior transmission qualities contribute to improved service and make for greater customer satisfaction. Available in size numbers: 9, 10, 12, and 14 B.W.G.

INSULATED SCREW EYES

Hot-Dipped Galvanized

The porcelain ring has a diagonal opening which allows the easy insertion of wires and when pulled taut they cannot become released from the ring.

The porcelain is glazed on the interior surface of the ring and on the surfaces of the slot.

IRONITE RUBBER INSULATED GALVANIZED IRON DROP WIRE

Twisted Pair and Parallel

Conductor is pure iron, drawn from a special Paragon Formula and heat-treated to produce a breaking strength, in No. 18 B.W.G., of 170 pounds. This is covered with two heavy layers of pure zinc—hot galvanized to iron conductor by the Crapo process. Insulation is of 30% pure rubber with an outside covering of stearine pitch, mica-impregnated braid. Black rubber on one conductor and white on the other provide perfect conductor identification.

ROSIN CORE SOLDER

Standard size No. 5 Kester rosin core solder is approximately 3/32 inch in diameter, running about 50 feet to the pound, in 1-pound spools. In sizes from approximately ⅛ inch to about .040 inch in diameter. Ribbon or flat type.

DOUBLE GROOVE WIRE HOLDER

Designed so that no metal is exposed after installation. Not affected by atmospheric conditions.

No. 1622, with 9/16 x ¾″ hole; weight per 100, 65 lbs. Packed 50 in a standard package.

DOUGLAS FIR CROSS ARMS

Manufactured from old growth Douglas yellow fir obtained from virgin forest in the northwest. Fir, because of its durability and light weight, compared with its strength, has been almost universally adopted for cross arm purposes by telephone companies. All arms are kiln dried so as to insure the uniformity of the seasoning. Modern machine equipment is employed in the surfacing of the arms and in the boring of the pin holes.

WOOD BRACKETS

These brackets are fastened to pole or wall by spikes. Holes in brackets are ⅞-inch diameter. Furnished painted or unpainted, except W.U. sizes which are furnished unpainted only. Brackets are securely wired in bundles of 20 or 25 each.

WOOD PINS

Made of locust wood. Is hard, close-grained wood, impenetrable to moisture and practically impervious to decay. Especially well suited for making wood insulator pins where accurate turning and freedom from shrinking or warping are primary considerations. All pins are shipped in heavy burlap bags.

No. 5223 Klein's Tool Belts

Drop forged standard D rings and buckle.

Made in sizes 36, 38, 40, 42, 44 and 46 inches. Specify length required.

STURGIS POSTURE CHAIRS

A distinctive line of metal chairs for telephone operators, designed to insure correct posture, thus reducing fatigue and increasing efficiency of operator. Back support is easily and quickly adjusted by hand. Seat height is adjusted by revolving. Many different combinations of seats and backs are available. These chairs may be had in brown, green, blue, black, or maroon enamel, with brown, green, blue, black, red or maroon leather; brown, green, or maroon fabric. Sold exclusively by Stromberg-Carlson.

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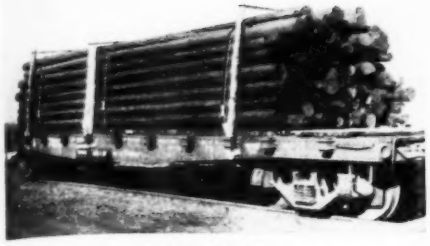


PINE POLES

Stromberg-Carlson offers a fine grade of pine poles—the ACW Brand—prepared by the Reuping Process which literally pumps creosote oil into the wood cells to combat nature's attacks on pine, and which results in a thoroughly reliable pole. Distribution points are scattered, resulting in low shipping cost and prompt reception by the purchaser.

CEDAR TELEPHONE POLES

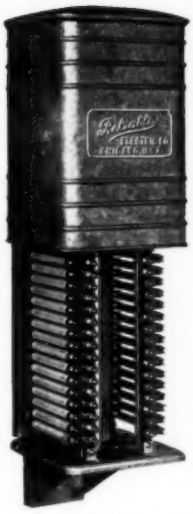
Almost as long as Stromberg-Carlson has been in business, it has been supplying cedar poles from the Page & Hill Company—a concern cutting its own poles, butt treating them, and carrying on hand a fine line of cedar poles—the kind that once set up one does not have to worry about.

LINEMEN'S RUBBER GLOVES
Rolled Top

A standard straight fingered linemen's glove built to A.S.T.M. specification in all details. Uniform at all points. Steam cured, lowest leakage, slow ageing and great flexibility. Tensile strength, 4000 pounds. Length, 14 inches; half sizes from 9 to 12 inches. Also furnished in curved hand style.

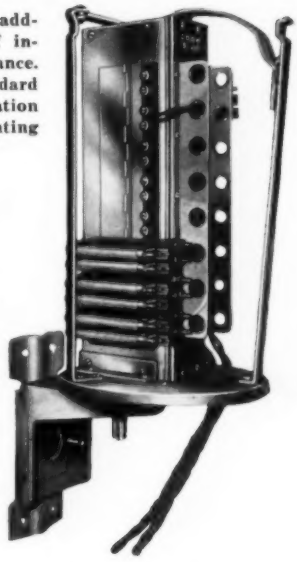
LINEMEN'S RUBBER GLOVE BAGS

Made of 36-ounce hard-woven duck with heavy webbing gussets. Front, bottom, back and flap made of one-piece, which adds to the strength and life of the bag. Equipped with two-way snap for convenience in detaching from D ring. Ventilating eyelets in bottom.



RELIABLE CABLE TERMINALS

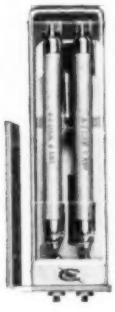
This terminal is an original design adding greatly to the convenience of installation, wiring, and maintenance. Made in three types for three standard cable terminal fuses and sub-station protectors. A detachable mounting bracket simplifies the installation.



COOK S-20 PROTECTED CABLE TERMINAL
with H-20 Protector Units

Offers maximum economy because protector units can be installed as required. Drops can be connected with or without protection. H-20 Protector Unit is a single circuit protector with two fuses and arresters mounted on a bakelite base.

Primary lightning arresters and subscribers drop connections are at the front. Secondary lightning arresters with wider air gap are at the front and provide high potential protection when fuse is blown.



COOK TYPE "O" SUB-STATION PROTECTORS

Are single circuit protectors made for both indoor and outdoor use. Body of arrester is porcelain. Fuse and Lightning Arrester Clips are of phosphor bronze. Lightning Arresters are Two True Gap Dischargers, and two flat carbons mounted on a copper ground strip are standard. The non-corrosive Everdur metal hood fits tightly to the sides and bottom of the porcelain. The hood is grounded through a strong Everdur hood guide. Made for various types and lengths of fuses.

No. 1000 RELIABLE PROTECTORS

Consists of two P495 sawtooth discharge blocks, two P197 carbons and two No. 55 fuses. Length, 9 in.; Width, 3½ in.; Depth, 2½ in. Weight: 1½ lbs.

No. 1067 COLLAPSIBLE NON-METALLIC BUCKET

For heavy duty. Made of No. 1 (25 ounce) canvas using one piece type of construction. Diameter at top, 13 inches; 10-inch square bottom; 16 inches high. Bottom reinforced with genuine harness leather which extends up the sides for 3 inches. Spliced ½-inch rope handle with heavy harness leather reinforcement at handle and at eyes on side for pole step loop.

BON AIR TELEPHONE BOOTH VENTILATOR

Sold Exclusively by Stromberg-Carlson

Leading experts state that a properly ventilated telephone booth brings added revenue to operating companies as a result of more calls being placed. The Bon-Air Telephone Booth Ventilator keeps air constantly in motion within the booth. The unit is mounted out of sight on the top of the booth at the rear. Fresh air is supplied to the interior of the booth through fibre tubes in conjunction with the ceiling fixture. The unit is quiet in operation and requires only a 25-watt input while operating.

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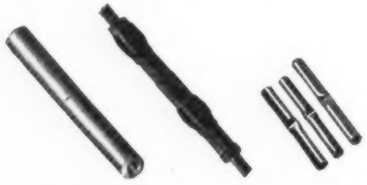
EVERSTICK Expanding Anchors

Made of Certified Malleable Iron. Available in several types of 2, 3, and 4-way anchors. For tight, tenacious, safe guy anchoring, for holding power to stand up under all conditions, for lowest cost installation, the EVERSTICK Anchor is supreme.

No. 1802-30 KLEIN SELF-LOCKING TACKLE BLOCKS

Especially for use with Klein's Wire Grips. Furnished with 25 feet ⅜-inch "Waterflex" Manila rope, 2½ lbs.

Consists of light steel shell blocks galvanized, fitted with snubbing hook to lock load in any position. To lock load, pull luff rope under hook. To release, simply pull rope. Blocks are arranged with spring guard snap hooks. When pulling up wire to make a splice, it may be used with two grips attached to snaps or with hook to anchor to an insulator pin or other convenient anchorage.



NICOPRESS SLEEVES AND SPLICES

When you make splices with Nicopress Tools, you have joints of maximum strength—stronger than the wire itself. Once the Nicopress sleeves are pressed onto the conductors, you have joints that are as tight as a weld.

DIAMOND DRIVE RINGS (New Style)

This ring accomplishes the same purpose as the screw threaded pigtail bridle ring, but is designed for driving instead of screwing into structures. When attached to wood, it is driven as an ordinary wire nail. When attached to hard substances, brick, stone or concrete, hammer drive anchors are employed.

Made of hard nail wire, hot-dip galvanized.

No. 6 COLUMBIA GRAY LABEL DRY CELLS With Fahnestock Connections

This dry cell is especially designed for telephone work and light drain service—2 or 3 for a standard magneto telephone. Voltage: 1½; Diameter: 2½ in.; Height: 6 in. Standard package: 25; Shipping Weight: 57 lbs.

No. 6 RAY-O-VAC Dry Cells for Telephone Service

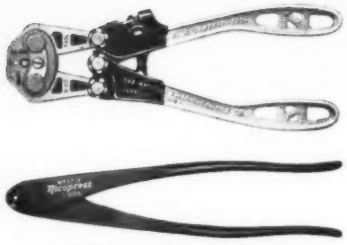
Equipped with screw binding posts or flat spring connectors, as required. Same dimensions as Columbias above, but shipping weight: 53 lbs. per package of 25.

KLEIN'S CLIMBERS, CLIMBER STRAPS AND PADS

Set consists of climber, 2 calf straps 1¼ x 22" with 4 x 4" pads, and 2 ankle straps 1¼ x 22". Leather is first quality harness leather. Buckle, drop forged, fitted with roller. When ordering, specify length of shank desired. Stock sizes: 15, 15½, 16, 16½, 17, 17½, and 18. Other than stock sizes made to order.

No. 1501 STROMBERG-CARLSON FRICTION TAPE

Stromberg-Carlson Friction Tape is made of a strong, closely woven cotton fabric which is thoroughly saturated with an adhesive insulating compound that retains its sticking qualities through all seasons. Tape per pound, 165 feet. Black ¾-inch tape put up in 1½-pound rolls; 2-inch width put up in 1-pound rolls.



NICOPRESS TOOLS

In making the splice by the Nicopress method, the tool must be of a size that is convenient and practical for the lineman to handle either in the air or on the ground. It must be so efficient in use that pressure can be applied with a certainty that each compression made will be exactly as required.

No. 31-DC—2-grooved, very comprehensive in its service. Will splice copper sleeves, 12 BWG sleeves for high tensile wire, etc.

No. 17-2—2-grooved—for drop, bridle, and inside wire.

No. 201 KLEIN SIDE-CUTTING PLIERS

Diamond special for use on bare and insulated wire.

Catalog No.	Size
201-6 N.E.	6"
201-7 N.E.	7"
201-8 N.E.	8"

No. 245-5 KLEIN OBLIQUE SIDE-CUTTING PLIERS

Vest Pocket Pattern 5" Size

HABIRSHAW WIRE

Habirshaw Ecco Brand Telephone Wire is sold exclusively by Stromberg-Carlson and in addition to Drop Wire comes in the following types: Bridle Wire, Interior Wire, Jumper Wire, Pothead Wire.

Use THE COUPON FOR COMPLETE SUPPLY CATALOG WITH PRICES AND QUANTITY DISCOUNTS

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Carlson Road, Rochester, N. Y.

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INDUSTRY—

The First Line of Defense

OCCASIONALLY during the past few months we have heard outbursts from several quarters that the national defense program is lagging, and an effort has been made to lead the American people to believe that industry is at fault in that it is not keeping production of defense materials on schedule.

Of course, in some cases, this lambasting of business is carried on by "leftists" and is designed to create sentiment for government control and operation of industry. Some individuals, in making their charges against private business, come out openly and directly in favor of the government taking over and operating key industries. Others hide behind a "smoke screen" by suggesting that a national emergency be declared, which, among other things, should make it possible for Washington to take over industrial plants.

In our opinion, before long the public will begin to get "fed up" with these wailings from socialistic-minded politicians because the people know by experience that in emergencies American business, as a whole, will meet all demands made on it if all other interested parties, including governmental bureaus, will meet their obligations.

While we are not fully acquainted with existing conditions in all industries, we have complete faith that none will shirk its obligations in the present emergency. However, we ARE in a position to defend the telephone industry from charges of non-cooperation being made against business. We know what telephone manufacturers have been doing, AND ARE DOING TODAY, to fulfill their obligation of producing quality and adequate communication equipment to fill the requirements of military and industrial units and of local operating telephone companies.

We are thoroughly informed on what the operating companies are doing in expanding their local and toll systems to provide adequate communication facilities to army camps, naval training schools, and to industrial organizations manufacturing defense items.

We know the patriotic attitude of telephone employes everywhere and of their unmatched loyalty and devotion to their country and to their employers in carrying out their duties in the national defense program.

We know all of this because we have been in close contact with manufacturers, operating companies and employes. Telephone people are proud of their service record in past emergencies, both in times of peace and of military preparedness, and this record bespeaks their ability and desire to carry out any job assigned to them by the government in the present emergency.

And above all, in our opinion, the industry's past performance clearly proves that under private leadership it can get the job done far better than under governmental control, subject to the direction of inefficient political bureaucracies.

One thing is certain, Uncle Sam can count on the telephone industry—employes and executives of both operating and manufacturing units—to meet any demand placed on it, efficiently, adequately and rapidly, if the government will see to it that a constant source of strategic raw materials is maintained for use by the manufacturers. The industry has pledged itself to do so.

Practical and fair-minded leaders of the national defense program who are acquainted with the activities and sentiment in the telephone industry know this is evidenced by the following statement made to TELEPHONY by Major General J. O. Mauborgne, chief officer of the U. S. Army Signal Corps:

> *"The telephone industry, both Independent and Bell, has been and is giving the government splendid cooperation in supplying adequate and efficient communication facilities in connection with the national defense program.*
>
> *"Communication is an all-important factor in preparing an effective defense plan and we greatly appreciate the cooperation extended by the telephone interests, both operating and manufacturing."*

Horizontal Drills

By RAY BLAIN, Technical Editor

Drilling a hole under street. Note hose for water connection.

THE HORIZONTAL type drill, a comparatively recent development, makes possible an ideal means of placing conduits under paved streets or other obstructions without disturbing the surface. The use of such a tool for telephone work is now believed important due to the recent increased use of underground cable construction and a prospective labor shortage.

Pavement is also of a more permanent nature nowadays and more costly to remove and replace. It seems regrettable, as well as being expensive, to cut new reinforced concrete paving. The obstruction of normal vehicular traffic flow on present-day streets always proves objectionable and never increases the good will of a telephone company in any community.

Pipe-pushing machines may often be used to advantage for the installation of lateral cables, but they do not always prove desirable for main runs in that the larger sizes of pipe cannot often be conveniently connected to various types of conduit such as vitrified clay, fiber, cement-asbestos or wood. The horizontal type drill will permit the use of regular conduit material in that ducts may be pushed through the hole made by the drill under the street, or through any other obstruction, and coupled to the main duct runs without the introduction of a pipe section.

Numerous types of hand-powered earth drills have been used for years with varied success. These drills proved satisfactory for boring holes for short distances such as under sidewalks, but were rather difficult for use under streets of even average width. Hand drills were equipped with sectional handles, but were always difficult to operate and it was almost impossible to use one to bore a straight horizontal hole for any distance. The power-operated drill overcomes all of these objectionable features in that it is easy to operate and will bore a hole accurately for a distance of 100 feet or more. We shall now describe briefly two popular models of horizontal type drills which are considered suitable for telephone use.

The first and smaller of the two drills being considered in this article comes in two different sizes which will cut a hole three or six inches in diameter. The three-inch size is powered by a 1.2 and the six-inch size by a 2.3 H.P., four-cycle gasoline engine.

The drill stem consists of ordinary ¾-inch pipe cut into two-foot lengths and connected by machine cut threads. The drilling machine operates on a tubular track 49 inches in length. To set up the drill, an excavation must be made 13 inches wide and 49 inches long, and of the necessary depth.

The track should be installed in this opening and leveled for grade and direction desired. When the street is level and a level hole is desired, simply level the track at the required depth with an ordinary hand level. When boring on a grade, sight the hand level to the opposite side of the street and note the location of the bubble; elevate the track so the location of the bubble will be exactly as sighted. A small inexpensive transit can be used to advantage in setting the drill.

Some companies when using this type of drill may desire to install conduit in ten-foot sections and in this case a ten-foot track will be required. However, in

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general telephone work, to permit the machine to be installed in parkways and small street openings, the short 49-inch track and the two-foot drill stem sections appear to be the most desirable.

Three different types of drill points are available although one termed "all purpose" will prove satisfactory for the average telephone job. This drill is similar to the fish tail type so commonly employed in oil well drilling. A variation of this type drill is used for sticky clay and adobe.

Both of these drills are two-bladed, but when rock is encountered it is recommended that the blades be faced with tungsten carbide. However, the general purpose drill will ordinarily prove adequate for all telephone work and the special types mentioned will not be necessary.

To use the boring unit, the machine should be placed on the track and hose connections attached for the water supply and siphon discharge. The purpose of the water supply is to assist the bit in cutting and to wash the dirt back to the sump located in the street opening. The water and sludge returning in this sump are then siphoned out into the street, thus protecting the equipment in the ditch and providing dry working conditions for the operator.

To use the drill, first turn on the water at the service cock on the machine and start boring by placing the clutch lever in the forward position and pushing the manual feed lever forward. When the machine reaches the front end of the track, turn off the water at the machine. Then the operator or his assistant holds the coupling nearest the machine with a pipe wrench and by throwing the clutch lever in reverse the machine unscrews itself from the drill stem.

The operator now moves the machine back and another section of drill stem is added. The drill stem should be threaded a couple of turns by hand and then the machine, placed in the forward position, runs the balance of the threads and boring is resumed. It is important that the water always be turned on when boring is resumed.

While the first two lengths of the drill stem are being added, frequent check for level and direction should be made as corrections are not difficult to make at this point. This machine will bore a straight line hole to a given point with amazing accuracy.

The manual feed feature immediately warns the operator when the drill strikes underground hazards such as pipes or conduits. This drill requires only one man to operate and is so small that it may be easily transported in an ordinary passenger automobile.

The other variety of power-operated horizontal type drill recommended for telephone use utilizes a sectional type auger. These augers come in three foot-four inch sections and have a male and female hex end with a hexaspeed coupling or a spring plunger that locks the augers together. When a hole has been completed the augers should be permitted to rotate slowly and to back out with power, leaving a clean hole.

When each auger section is clear of the hole, the hexaspeed coupling should be depressed and the auger sections uncoupled until all are out of the hole. One model will bore a four and one-quarter inch hole which is large enough for practically all general telephone work.

This unit may be set up in a hole $2\frac{1}{2}$'x6' dug to a depth necessary to bore a hole on the proper grade under streets or other obstructions. This drill may be set up and operated by a crew of only two men. The operator is warned when obstructions are encountered by the feel of the feed on the manual control. This feature permits stopping the machine and prevents burning up the head and bits.

The drill recommended for general telephone work is powered by a 7 H.P. single cylinder, air-cooled, gasoline engine, mounted on a pneumatic-tired barrow which permits the engine to rotate in either direction.

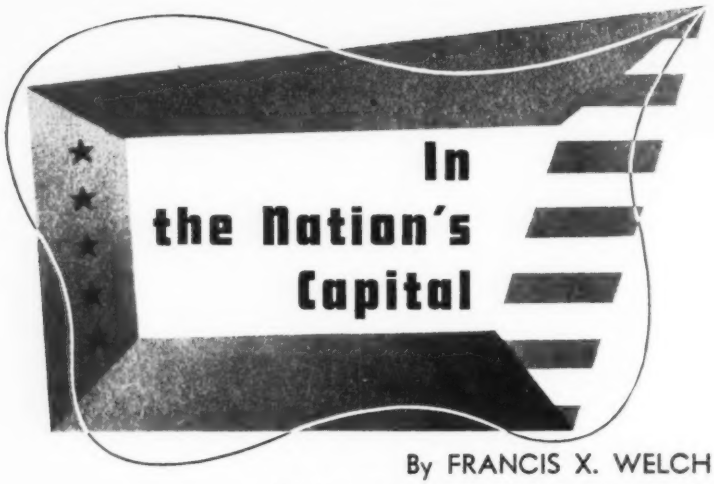
From the clutch of this engine, power is transmitted through a one-inch flexible shaft to the machine proper, where, through reductions, speed is reduced from 2,100 to 165 revolutions per minute on the drilling shaft.

This shaft is connected to the augers proper through a flexible coupling which gives proper alignment at all times. All speed reductions are made through chains and sprockets with an adequate factor of safety. Ball bearings and high grade steel are used throughout. The complete unit weighs only 750 pounds.

Larger drills may be obtained when desired. Drilling members, or augers, as used on all models of the drills are made with patented interrupted scrolls and secondary cutters which make them self-cleaning in all soils, leaving, upon the withdrawal of drills, a clean hole which permits the easy installation of conduits.

(Please turn to page 48)

Horizontal drill in operation.



By FRANCIS X. WELCH
Washington Correspondent for TELEPHONY

Telephone industry's classification on aluminum priority for civil use is disturbing. . . . Local telephone systems must be expanded to take care of increased traffic caused by defense activities. . . . Manufacturers need strategic metals for equipment to meet both defense and civil communications requirements.

THE "INDEX classification" given to the telephone industry's participation in aluminum by the Priorities Division is disturbing. It is disturbing because it may well presage the treatment which will be accorded the civilian phases of the telephone industry with respect to priority participation in the available supply of other strategic metals, for installations or other new expansion work. But it should not come as a surprise to regular readers of this department.

Your correspondent made an effort by direct inquiry to the Office of Director of Priorities to get some definite expression as to the reasoning behind the low aluminum rating given to the telephone industry. The best he could do was an informal discussion in which direct quotation was forbidden. The gist of this discussion will be covered later.

First of all, what rating *does* the telephone industry get? Technically, it is known as "B-7." The very lowest rating given to *any* industrial user is "B-8." That is the classification assigned to "aluminum cooking ware," in which the commercial industry has been virtually notified to get out of business, as far as using aluminum is concerned. It will have to use some substitute material.

In order to understand this priority business at all, it is necessary to bear in mind the distinction between Class A and Class B. Class A means direct defense uses: (1) By industries serving the organization of facilities for the Army, Navy, Marine Corps, Coast Guard, and other defense agencies; (2) by industries similarly engaged in the production, manufacture, or processing of materials for friendly belligerent democracies under the lend-lease bill; (3) by industries of such vital importance with respect to their relation to industrial operations in the first two groups as to warrant similar preference.

The only private industry group given an "A" class rating with respect to participation is available aluminum supplies (under the third category in the foregoing paragraph) was "blast furnaces, steel works, and rolling mills," which got a rating of "A-10" for deoxidizing ingots. The Division of Priorities explained that "this rating is assigned so that the quantity of such deoxidizing ingots will not be limited under the percentage formula."

Of course, telephone usage of materials requiring aluminum in the construction of facilities for Army camps or other direct defense activities would enjoy a similar preferential rating. So, also, for obvious reasons, would telephone manufacturing companies working on orders clearing through the Office of Production Management; such as for the manufacture of cable for the Signal Corps or radio equipment for naval units.

* * *

What about the civilian phases of the telephone industry? As far as mere maintenance is concerned, the industry already had (under an order of March 21) a very good B-2 preference: "For repairs or equipment parts for existing apparatus, equipment and devices which must continue to function in order to preserve essential services." But it is with respect to new installations and expanded facilities that the most spec-

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tacular demands are expected to be made upon the industry in the months ahead.

There evidently was some hope among telephone men that this view might have prevailed in the Office of the Director of Priorities, at least to the extent of getting the telephone industry a little better rating under the "B" classification. Of course, all "B" classifications necessarily come after "A" classifications. This means that they have to take pot luck on a percentage basis in the order of their preferential rating after all the "A" classifications have taken what they need.

Well, here are some of the items mentioned in the index issued by the Division of Priorities on April 18, together with the preference ratings assigned:

Laboratory and hospital furniture, B-3. (B-3 is the rating applied to orders for products essential for the protection of public health or safety.)

Lithographing plates, B-4. (This rating applies to orders for standard apparatus which cannot be redesigned to use substitutes without serious disruptions and for which there is substantial use in defense channels.)

Drugs, medicines, toilet preparations, insecticides, and related products, B-3.

Industrial chemicals, B-4.

Petroleum refining, B-4.

Iron and steel foundry products, B-4.

Aluminum cooking ware: for hospitals, B-3; all other uses, B-8. (B-8, the lowest rating, applies to products in which a reasonably satisfactory substitute for aluminum is or can be made available.)

Communication equipment and related products, generally B-7. (This applies to products in which no reasonably satisfactory substitute for aluminum is available.) This classification includes the following units:

Telephone and telegraph parts	B-7
Teletype parts	B-7
Condenser cans, radio	B-7
Variable condensers, radio	B-7
Condenser foil, radio	B-7
Loudspeaker parts, radio	B-7
Microphones, radio	B-7
Recording discs, radio	B-7
Tube shields, radio	B-7
Fire alarm sirens	B-7
All other uses	B-8

Refrigerators, B-7 for evaporators, grids, and air-conditioning equipment; all other uses, B-8.

Automobiles and automobile equipment, B-4.

Aircraft and parts, B-8 for civilian uses (except as higher ratings or allocations may be provided in special situations.)

Professional and scientific instruments, B-3.

Electrical appliances, including washing machines, vacuum cleaners, and toasters, B-7.

Under an order issued on March 21, suppliers of aluminum were placed under a general preference order and were furnished with a schedule of preference ratings. Since then, the suppliers have been required to fit their customers into these preference classes. The index announced last week will regularize the classification of orders throughout the industry.

You will notice that the electric utility industry also came off with a "B-7" rating for units which include: Circuit breakers, meter discs, motors, testing equipment, search-light housing, and welding shields. In the electric appliance equipment the "B-7" listing is assigned to clocks, clothes and dish-washers, irons, toasters, mixers, vacuum cleaners, refrigerators, and other accessories.

* * *

FRANCIS X. WELCH

Why this low rating for telephone participation in aluminum supplies? Well, this is all very unofficial; but the story, as your correspondent gets it, runs something like this:

The operating telephone industry is pretty well established. Its lines are already in place and its central stations are, for the most part, pretty well set up. It is realized in Washington that there will be more expansion and continuous demand for civilian subscriber stations as the defense boom picks up the mass purchasing power of the nation.

But there is also in Washington an impression that the industry, for the present, is sufficiently supplied with spare equipment; that it can take care of its new civilian station demands (along with current maintenance) without being given any special preferential treatment on aluminum supplies. Of course, the industry's expansion needs for military purposes are taken care of under "Class A."

The inference is that the industry must make every effort to find substitutes for aluminum, and other strategic metals as they become subject to priority. If necessary, and in a pinch, the industry must not hesitate to make good use of reconditioned equipment and to salvage junked or obsolete units for the same purpose. If these steps are taken, the Priorities Division evidently feels that no civilian in the United States who really needs telephone service, and can afford to pay for it, will have to do without it.

The operating telephone industry probably hopes so too, but the pinch will undoubtedly be felt as the months go by under this restrictive set-up, especially when other materials, besides aluminum, begin to take their seats on the priority platform.

Best evidence that the telephone industry is going to do its best to keep "service as usual," despite increasingly difficult operating conditions, was seen in the recent statement to the stockholders of the A. T. & T. by its president, Walter S. Gifford, who stated: "We have pledged to the Priorities Division of the Office of Production Management that we will make every effort to reduce our use of such materials, even at some penalty in cost and effectiveness. It is not a simple matter, but we have already made some real progress and we hope to go further."

Mr. Gifford was here discussing availability of a number of materials required in telephone plant and construction. He observed that engineers throughout the Bell System have been working to find substitutes for such important items as aluminum, nickel, zinc, and magnesium.

This is also true of the Independent industry as all operating companies and manufacturers have pledged themselves publicly to gear their operations to keep intact their service record in emergencies.

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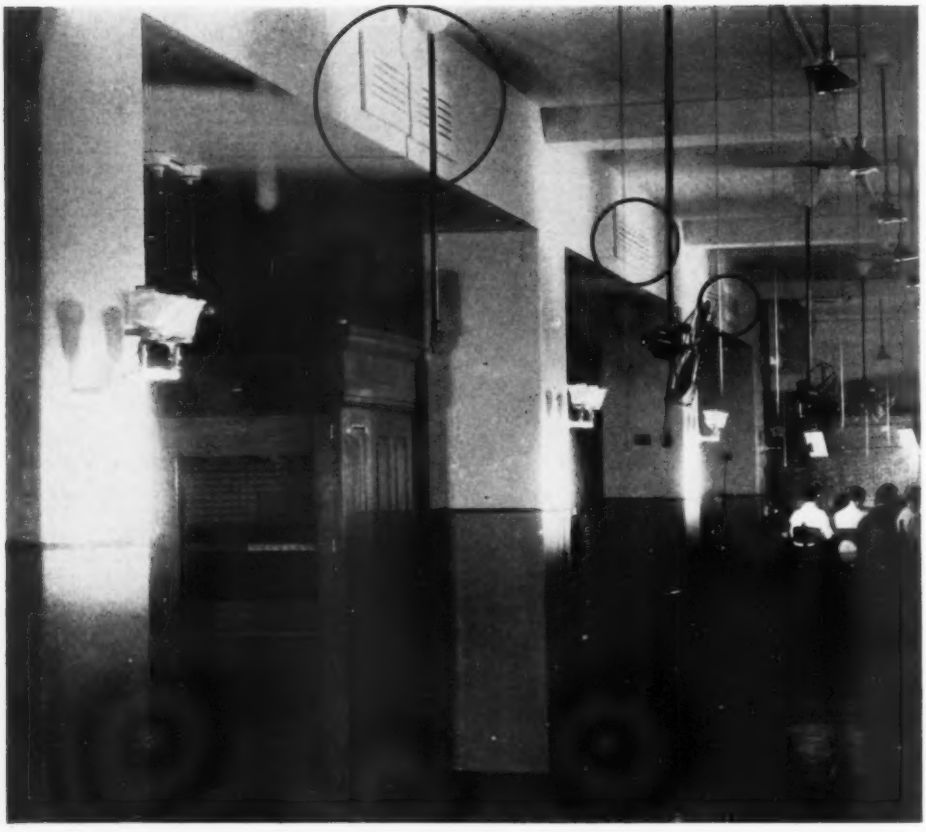

Large manual office air conditioned. Note neat duct system and air outlets near ceiling (circled).

Air Conditioning THE EXCHANGE

By W. H. MARTIN

CHARLES DUDLEY WARNER once said: "Everyone talks about the weather, but no one ever does anything about it." However, that was before the development of air conditioning, for now weather is actually made to order for indoor workers.

Without a doubt, modern air conditioning pays its largest dividends in the telephone exchange. Neither is air conditioning now considered a deep mystery, nor is its cost prohibitive for use by the telephone industry. In fact, an air conditioning system is now no more costly than a good heating system and the two may be combined to advantage to provide year-'round comfort.

Summer air conditioning consists of cooling, dehumidification and air motion while winter air conditioning includes heating, humidification and air motion. Air cleaning and the simultaneous control of the three features must be provided in either summer or winter conditioning.

No attempt will be made in this article to supply design information on any particular type of air conditioning system as such data may be readily obtained from any manufacturer's representative.

We shall attempt to confine our efforts to the type of equipment available and the many benefits which may be derived from its proper use. By so doing, we hope to reduce the fear so many seem to have that excessive costs prohibit the use of air conditioning in the modern telephone exchange.

The opinion is occasionally voiced that air conditioning is detrimental to health. This assumption is ridiculous, for practically all hospitals now have their operating rooms, if not entire buildings, air conditioned. Studies conducted by various large insurance companies over extended periods also indicate that less time is lost by employes due to common colds and other ailments when working in properly air conditioned buildings.

Further proof that air conditioning contributes to good health is indicated by the fact that Gargantua, the only gorilla that has ever been able to live in captivity for any length of time while touring the country for exhibition purposes, has always occupied an air conditioned cage. There now appears to be no

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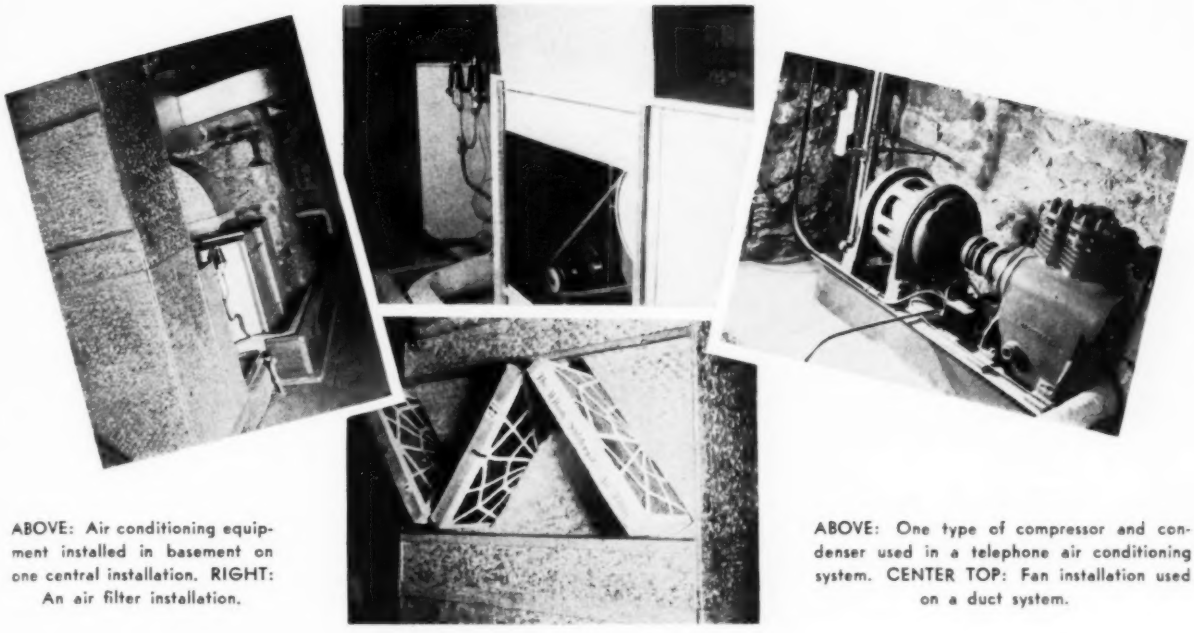


ABOVE: Air conditioning equipment installed in basement on one central installation. RIGHT: An air filter installation.

ABOVE: One type of compressor and condenser used in a telephone air conditioning system. CENTER TOP: Fan installation used on a duct system.

reasonable doubt that air conditioning of the proper type is a material aid to good health.

The air we breathe is more important than some may think. The daily menu of the average individual consists of approximately three pounds of food, four pounds of water and 35 pounds of air. We may live several weeks without food, a few days without water, but only minutes without air. There seems to be no good reason to doubt that the air we breathe when we are forced to live and work indoors should be as clean and properly prepared as the food and water we consume. When this is done, there will be a material improvement in the general health of the nation.

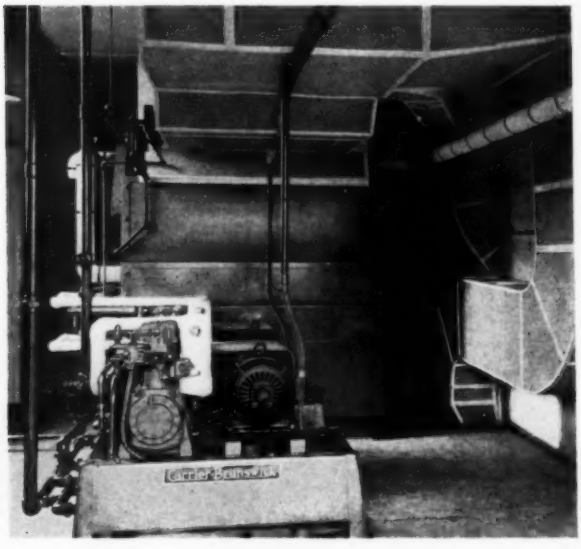
Three different forms of temperatures are considered in all air conditioning work, i.e., dry bulb, wet bulb and effective temperatures. The dry bulb is temperature of the air as usually read in Farenheit degrees on the common variety of thermometer.

The wet bulb temperature readings are obtained by swinging a thermometer with a wet wicking cover on the bulb. A thermometer of this type attached to a sling so that it may be rotated is called a psychrometer.

Effective temperature is known as a body sensation and is a true indication of what one feels. This temperature is most important in determining the comfort of the occupants of any air conditioned space.

(Please turn to page 45)

LEFT: Unit air conditioner suitable for small or medium-sized exchange. BELOW: Air conditioning equipment for large telephone exchange.



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USE OF EARTH BORING MACHINE *Is Economical*

By Edward Benton

THE LONG handle shovel and spoon method of pole hole digging has never been considered an easy task as any old time groundman will readily agree. Not only is the manual method difficult, but it requires considerable time, which is an important factor in these days of speed and general high pressure.

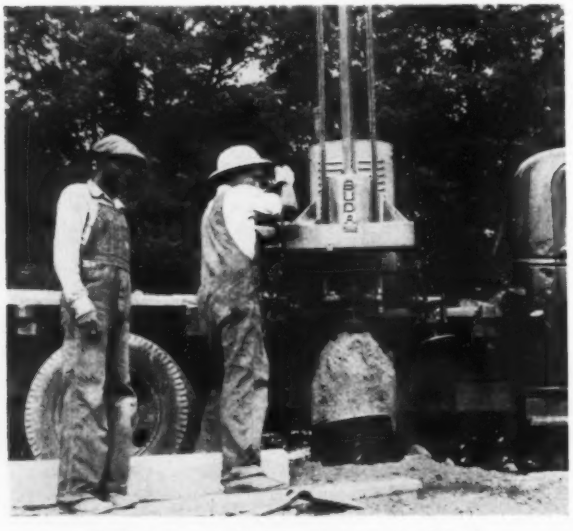
There appears to be no doubt that, due to the general labor shortage which will confront us throughout the country in the near future, there will be a considerable increase in the use of earth-boring machines in the telephone industry during the next few years.

The combination earth-boring machine and pole setter is especially suited for telephone use. These diggers may be mounted either on a truck chassis, a trailer or on a caterpillar tractor. When mounted on a truck the 1½, 2½ or 3-ton chassis may be used.

The trailer type digger appears to be well suited for telephone work because an expensive truck need not be tied up when the digger is not in use. One type of drill unit can be easily mounted on the rear of a standard truck and removed when not in use so that the truck may be released for other work.

Some telephone men claim they cannot afford to purchase an earth-boring machine as the carrying charges on the investment would be excessive and would offset any labor savings. This is not ordinarily true when considerable pole line is to be constructed. The purchase of a less expensive machine should be considered for the smaller companies which do not have a large volume of pole setting to be done.

Digger mounted on rear of truck. The digger may be controlled by the operator standing on the truck or ground. Note new type telescope pole derrick.



Earth boring machine mounted on side of truck.

The earth-boring machine, if properly used, will prove a real economy. One company reports a saving of $121.28 per day when using a tractor-mounted boring machine. Another company is proud of a saving of $2,843.75 in 125 days, netting a saving of 174 per cent on its investment in a trailer model digger. Still another company estimates a saving of $1.60 a hole over the hand-digging method or 47 per cent reduction in labor cost. A large company reports a saving of over $700 in the first 44 days' operation of its truck-mounted digger. These are only a few of the reports of savings from the files of one manufacturer.

The modern earth-boring machine is entirely satisfactory for use in practically all soils. This includes sand, clay, shale, hardpan, swamp-land and frozen ground. The drill may be powered from the truck or tractor engine by a power take-off or by a separate motor mounted on the unit near the rear of the truck.

When a separate motor is used, three different sizes are usually available depending on the size of the digger used. They are a 12 H.P. twin cylinder, air-cooled type; a 25 H.P. four cylinder water-cooled type, or a 40 H.P. water-cooled engine for extra heavy duty.

One type of earth-boring machine, which is considered fairly representative of all diggers now available, will be described in detail. The mechanism of the drill is especially well-designed and will give many years of trouble-free operation when properly maintained. All parts of the drill head are assembled in one unit which insures perfect alignment. The drill head is also rust-

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Digger mounted on truck, showing compactness when not in use.

Earth boring machine mounted on tractor at work in rough country.

proof. The clutches are carried on spline shafts operated by ball bearing throw-outs. All drive shafts are also carried on ball bearings. The drill spindle is made of special alloy steel and all gears run in oil.

The lifting mechanism is well-designed and exceptionally strong. Two roller chains are used for lifting the dirt from the hole. These chains are located on each side of the spindle and are so equalized that each carries an equal load. These chains are self-cleaning so that mud and dirt cannot lodge in them and cause excessive wear. The gears in the lifting mechanism are fully enclosed so that dirt carried up by the spindle cannot enter the housing and cause trouble.

When the drill, with its load of dirt, is raised from the hole it is automatically locked when it reaches its highest position. The lifting clutch is automatically released and a band brake engaged so the drill cannot over travel and hit the drill head. Neither can it drop back into the hole.

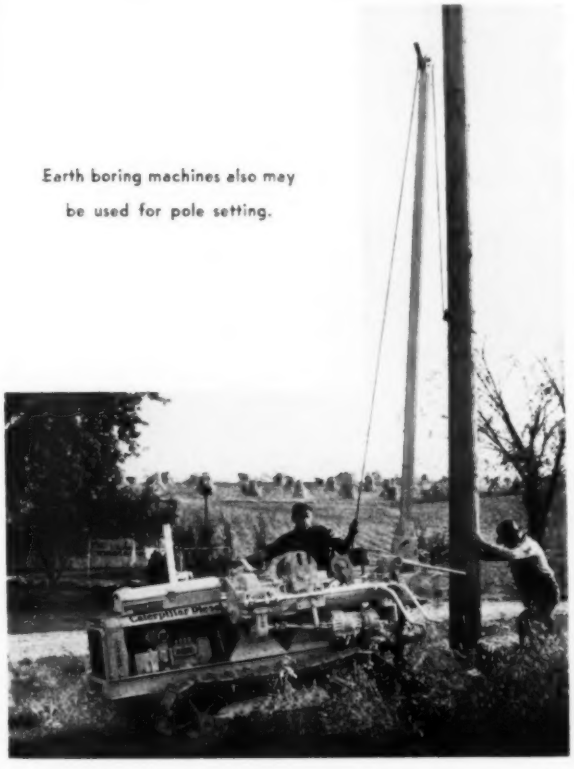
The controls of the drill are simple and easy to operate. To feed the drill into the ground, the operator simply has to move a bar up and down as the handle on a jack. The clutches are easily adjusted. Drills can be obtained up to 42 or 48 inches in diameter and they will bore holes to a depth of 10 feet. Special drills which will bore to a greater depth may be obtained if desired. Blast hole drills 1¾ inches in diameter may be supplied for handling softer rocks when necessary.

A power leveling device, when actuated by a slight pressure on a lever of the control, permits the auger to swing at any angle for the digging of anchor holes or for the necessary adjustment to permit digging straight down regardless of the position in which the truck may be placed. This proves a real advantage, as the digging of anchor holes is always a difficult task when attempted by the hand auger method.

While it is true that the caterpillar tractor is much easier to maneuver than a truck, the present day four-wheel drive truck may be handled very well on almost any kind of terrain. Also special structural aluminum skids are now available for use in moving trucks across ditches. These skids are generally about nine feet in length, weighing less than 80 lbs., and may be easily handled by one man.

The pole derrick attachment is considered a necessity with any earth-boring machine. Power-operated telescope derricks are available for use on the various types of earth-boring machines. It is a simple matter to erect the pole and drop it into the hole before moving to the next hole location. The winch for raising the pole is powered by the same motor that is used for operation of the auger.

For the telephone companies interested in an earth-boring machine to be used for pole hole digging and pole setting, it is suggested that the various manufacturers of this type of equipment be contacted. They will be glad to furnish necessary information. Assurance is given that a type suited to any need is now available at a price surprisingly low and within the reach of many Independent telephone companies.



Earth boring machines also may be used for pole setting.

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Begin Spring Construction with Safety

While the author has briefly touched upon several safety ideas application of his suggestions should be helpful in eliminating accidents

DUE TO the fact that our country is mobilizing a great army of young men, and is using an enormous supply of telephone and telephone line material, in all probability we will be asked to conserve both man power and material. This does not necessarily mean that we will be compelled to do with less equipment or help, but it will mean that we will have to do the most with what we have.

Conservation of materials and labor will result in our giving more thought to the proper care and maintenance of our tools, materials and supplies, cars, and, above all, to the safety of the men who will join the telephone work this spring.

This year we may have to employ some men either younger or older than usual, and it will depend on supervisors to see that they are thoroughly instructed to do their new job safely.

The new groundmen will have to learn how to pick up and carry rather heavy materials as poles, crossarms and coils of wire; how to handle a pike pole; how to use an axe and saw and a great many other unfamiliar tools, probably in a short space of time.

Many new employes will have to learn how to tie various knots in a line, such as a square knot, bowline and double half hitch. If the company has a printed set of rules and safety practices (and they all should) it will provide good reading matter for the new man for several evenings.

Tool inspection should be an important part of our spring construction safety program. Shovels with cracked blades or handles should be repaired or replaced, ropes in blocks examined carefully as should all slings and pulley blocks. Chisels with mushroomed heads should be ground down, pike pole handles checked for slivers and cracks, and ladders inspected for loose rungs and weather cracks.

In connection with ladders and wood handled tools, a good treatment to preserve the wood is as follows:

When the wood is new and untreated, fill it with linseed oil and let it dry thoroughly. Then apply one coat of a good water-spar varnish. When this dries, sand it well with fine paper and apply a second coat of varnish. This treatment will result in a hard durable coating that will not flake or chip and in addition makes it easier to detect any small checks or cracks that may appear.

Edged tools such as saws, framing chisels and axes should be provided with leather or fiber guards which will not only preserve their usefulness, but will also prevent their cutting employes or other tools.

Screwdrivers with split handles that have been taped should be discarded; a popular tool on the market now has a handle made of plastic material which is very easy to grip and is practically unbreakable.

Spring construction will of course mean the unloading and storing of quantities of material—wire, crossarms, poles, hardware, etc. Before bringing this material into the storeroom, it is always a good plan to clean the floor of litter, such as loose boards, pieces of old wire, glass, nails, etc. Also any spots of wax or oil that may have accumulated should be removed from the floor.

If the material is to be stored in a shed, be sure the flooring is strong enough to support the load. A filled fire extinguisher should be placed in a convenient place in the shed, and the lighting should be adequate.

In piling new wire, great care must be taken, as the

BELOW: Comparison of new and old types of cable cars. Note safety features such as chains, wide seat board, large rubber-tired wheels equipped with brake and full sized guards on new model (left).

ABOVE: Safety guards should be kept on such tools as saws and pike poles.

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on with Safety

By ROBERT DEVORE

new coils have a tendency to slip when piled on each other. A small strip of burlap placed between the coils will help avoid this.

Poles should be piled clear of the ground, and preferably in such a location that the truck may drive around the piles. To avoid an early crop of weeds, the ground around the piles may be given a good dose of rock salt, cinders, or gravel early in the season.

Incidentally, in handling new poles, don't forget that creosote burns are very painful, so don't spare the vaseline when working with new poles.

Try to inspect cars and trucks regularly. A few minutes' time each month will save quite a bit in repair bills, and may avoid laying up a car just when it is needed most, or may eliminate a cause for an accident. Tires, brakes, glass, trailer hitches and material compartments are things to be checked.

Among tools that should be carried on trucks and taken off when it stops are "Men Working" signs. These square metal signs mounted on a tripod, with black letters on a yellow background, command attention on a busy highway. Some are fitted with sockets for red flags. It only takes a minute to place and pick up these markers, and they will help slow down traffic, thus protecting employes while at work.

In preparing your spring construction program it is well to hold first aid classes. If your company does not have a certified instructor, consult the local chapter of the Red Cross and it will be glad to organize a class, without cost to you. Every telephone man should have a working knowledge of artificial respiration, treatment of fractures and shock, and control of severe bleeding.

These are very important and the little time spent in preparing employes to give this first aid may be worth quite a great deal in an emergency. The complete standard course takes only 20 hours' study and it's well worth it.

Crews working on toll or farm lines should learn to recognize poisonous plants which may be common in their section of the country. Among the most prevalent poisonous plants are poison ivy, oak and sumac. The most common of these is possibly the ivy, which may be a climbing plant found on fences, trees or poles, a crawling vine, or even a low shrub.

Poison oak is quite similar to ivy in appearance, with the exception that the oak leaves are more deeply notched. These plants grow rapidly, and may spread over a large area. The leaves are a deep green, in clusters of three, and the stems of the plants grow bunches of small white berries. These berry clusters are also

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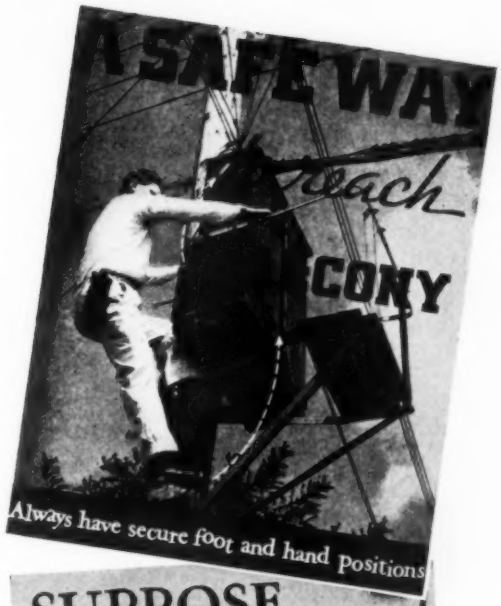

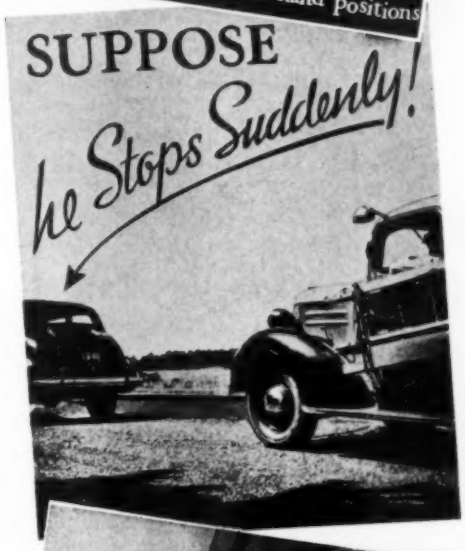

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CHAS. C. DEERING

R. A. PHILLIPS

Iowa Independents

Seek More Toll Revenue

Committee studying Independents' cost of rendering toll service, with view of obtaining greater commissions from Bell company, presents report at Iowa convention. Varied program inspires good attendance at sessions.

SECURANCE of a more equitable division of toll revenues between Independent companies and the Northwestern Bell Telephone Co., cooperation of the telephone industry with the government in the national defense program, and increasing revenues to the necessary level through exchange rate adjustments were the principal points of discussion at the 46th annual convention of the Iowa Independent Telephone Association. It was held April 15, 16 and 17 at the Fort Des Moines Hotel, Des Moines. All sessions were well attended by the more than 375 people who registered for the three-day meeting.

The annual banquet was held Wednesday evening, April 16, and more than 400 persons enjoyed a pleasing floor show and dance which followed the banquet.

The following directors were re-elected for three-year terms: A. J. Adams, Chariton; W. H. Daubendiek, West Bend; T. J. Griffith, Fort Dodge, and H. B. Melick, West Liberty. Major C. B. DeWitt, Lime Springs, was elected to fill the board vacancy caused by the death of C. W. Quillen of Mt. Pleasant.

At the organization meeting of the directors, the following officers were elected: President, R. A. Phillips, Sioux City, vice president and general manager of the Central Electric & Telephone Co.; vice presidents, Geo. E. Atkinson, Creston, manager of the Creston Mutual Telephone Co., and C. A. Farrington, Centerville, president of the Appanoose County Telephone Co.; and secretary-treasurer, Chas. C. Deering, Des Moines.

The convention was opened Wednesday morning, April 15, with an address of welcome by President Phil Zerwas, of Manning.

Secretary Deering then presented his annual report of the activities of the association during the past year. He stated that 17 district meetings were held during 1940, which were attended by a total of more than 1,000 telephone men and women from all parts of the state. He stated that several companies, which needed increased revenues to meet rising costs of operation, secured relief through upward revisions of exchange rates, without meeting much resistance from subscribers.

In closing, Mr. Deering recommended that those companies needing more revenues should consider asking immediately for higher rates for exchange service.

Members of the staff of the Northwestern Bell Telephone Co. presented two interesting movie films; one showing the installation and construction features of the coaxial cable, and the other designed to educate rural switch line subscribers as to proper methods of constructing and maintaining rural lines and installing telephones.

One of the principal features on the Wednesday program was a report of the association's toll compensation committee, which has been studying the matter of compensation received by Independent tele-

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phone companies for toll traffic interchanged with the Bell company.

During 1940 the association established the committee which is composed of: R. A. Phillips, Sioux City, chairman; Secretary Deering; L. F. Morrison, Grinnell, and J. F. Walters, Toledo.

In his report, Chairman Phillips traced the history of toll compensation in Iowa, pointing out that as early as 1910 Independent companies received 25 per cent of their originating business. The committee found that a good many exchanges in the state received 30 per cent or less even to this date.

Extensive negotiations have been carried on between the committee and representatives of the Northwestern Bell Telephone Co. and, while progress has been made, no agreement has yet been reached.

Mr. Phillips described the studies that were prepared by the committee as to the costs of originating and terminating traffic interchanged with the Bell company. These studies were made in great detail for certain exchanges considered typical of the Independent industry in Iowa.

The result of these studies indicates that the present compensation schedule for exchanges operating on a tributary or pass to center basis is at least 40 per cent too low and does not compensate the Independents for all of their costs incurred in the interchange of business.

During the Iowa convention last week the cameraman found this group of prominent telephone men (left to right): CHAS. C. DEERING, Des Moines, re-elected secretary-treasurer of the Iowa association; PHIL ZERWAS, Manning, retiring president of the state association, and LOUIS PITCHER, Chicago, executive vice-president of the U. S. Independent Telephone Association.

Corridor snapshots at the Iowa convention last week depict the following: (1) HOWARD LEINARD (left) of Cleveland and PHIL ZERWAS of Manning, retiring president of Iowa association. (2) Left to right, D. J. PAISLEY, Rockwell City; J. R. DENKHOFF, Dyersville, and W. T. AUTRY, Dyersville. (3) TOM J. GRIFFITH, Fort Dodge. (4) HENRY B. MELICK (left), West Liberty, and I. G. CARLL, Des Moines. (5) W. H. HOLLIS and T. F. DUCKETT, Sioux City.

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Working at the registration desk during Iowa convention are (left to right, facing camera): LURA GOLDING and MARJORIE SCHLENKER of the Iowa association; MRS. GERTRUDE M. JOHNSTON of the Des Moines Chamber of Commerce Convention Bureau.

Mr. Phillips said that there was apparently serious disagreement between the two groups as to certain fundamentals involved in traffic cost studies.

"The committee takes the position," he said, "that in the absence of complete showings that all of the revenues derived from toll business interchange between the Independents and the Bell are divided on an equitable and fair basis—such evidence to include the investments of both groups and the representative costs incurred in handling the traffic—we must rely on the assumption that, provided the Independents are compensated for all of their costs, the total revenues are divided equitably.

"This makes it imperative, however, in view of the costs of only one of the parties being discernible, that all of the costs—including the investment, depreciation, and maintenance cost of the physical plant—be included, and compensation be established to reimburse the Independent industry for all of such items."

Attention was called to the Federal Communications Commission's order, dated April 2, 1941, issued to the American Telephone & Telegraph Co. and its associated companies, to show cause by June 9 why interstate toll rates should not be reduced. In view of this order, Mr. Phillips' committee takes the position that if, as it believes, present compensation to the Independents for the services they render in handling interchange toll business is entirely too low, it is all the more imperative that immediate steps be taken to rectify the condition, as otherwise toll rates which do not include all of the costs of rendering toll service might be established.

Following Mr. Phillips' report, Louis Pitcher, Chicago, executive vice president of the United States Independent Telephone Association, addressed the convention on "National Affairs."

Mr. Pitcher asked that all telephone companies give their fullest cooperation to the government in connection with the national defense program. He stated that the telephone industry is represented on the defense communications committee and that the groundwork is being laid for the greatest utilization of the nation's communications network.

Wednesday afternoon's session opened with an address by Harold E. Davidson, Des Moines counsel, Iowa Commerce Commission, on "High Line Hazards." Mr. Davidson explained the highway beautification program being carried on by the Iowa Highway Commission and stated that the commerce commission, which has jurisdiction over the construction of utility pole lines, is cooperating with the highway commission in seeing to it that pole lines are constructed to fit into the highway beautification program. He asked that all telephone companies cooperate with the state in its effort to improve the appearance of highways as well as achieve greater safety.

Irwin J. Lubbers, Pella, president of Central College, presented an inspirational address entitled "Freedom's Crowning." Mr. Lubbers, who has spent considerable time abroad, gave his impression of the present European war and made certain predictions as to its outcome. He prophesied that England will win the present conflict because the history of the world has proved that agressors such as the present European dictators have never succeeded in forcing their ideologies on the world and that the present effort of the Axis will also fail.

One of the most interesting numbers on the program was the address on "Procedure for Improvement of Inadequate Revenues by Exchange Rate Adjustments" prepared by Norman Shenk, Newton, general manager of the Iowa State Telephone Co. Mr. Shenk was unable to be present because of illness and his paper was read by Mr. Miller, of his company's staff.

Mr. Shenk traced the results of a 1939 study of exchange rate structures of Iowa Independent companies by the association's rate and research committee, which showed that many exchanges were attempting to operate with rates that did not produce sufficient revenue to cover expenses of sound operation.

It was pointed out that with increased taxes, labor costs, metallicizing expense, etc., these exchanges need even more revenue than was necessary in 1939. Unless steps are taken to bring about an increase in revenues, many exchanges in the state will soon be in a precarious position, it was predicted.

Mr. Shenk presented a well-designed procedure for obtaining an increase in exchange rates which could be followed by the average Independent telephone company.

His paper was so interesting and instructive that it will be published in a future issue of TELEPHONY.

The last session of the convention on Thursday morning was devoted to an open discussion on problems confronting the industry. The meeting was presided over by A. J. Adams, of Chariton, and H. B. Melick, of West Liberty.

Lively discussions were held on such topics as ways and means of improving and increasing rural service, selling directory advertising, underground cable construction, long-span line construction, wage and hour regulations, and increasing toll compensation for Independent companies.

TRAFFIC CONFERENCE WELL ATTENDED

More than 100 telephone operators from all sections of Iowa attended the annual traffic conference held during the 46th convention of the Iowa Independent Telephone Association in Des Moines, April 15, 16 and 17. Miss Anne Barnes, the association's traveling chief operator, was in charge of the conference and as usual she had arranged a program of outstanding papers and discussions on solutions to present-day traffic problems.

The first address of the conference on Wednesday morning, April 16, was entitled "Collect" and was

(Please turn to page 44)

XUM

The Plant Man's Notebook

By RAY BLAIN
Technical Editor

THE PICTURE of L. M. Baker in the April 5 issue of TELEPHONY attending the Oklahoma convention reminded me of the days long ago out in the Panhandle country when he and I worked on a line gang together. Now, it can be told without fear of being dubbed egotistical that we were the fastest phantom and transposition-cutting team that section of the country had ever known. We once cut 29 phantom transpositions and mounted our own brackets in a single afternoon. Perhaps the wires did click together occasionally, but a little line trouble was not considered overly important in those days.

* * *

We are indebted to J. R. Harrington, vice president of the Autocall Co., for a clever demonstration of its Howe transmitter and manhole supervisory device, conducted by C. L. Metzgar and F. W. Beyer. The small unit transmitters of this device may be mounted in a manhole or a cable terminal and arranged to operate automatically when the cover is removed. The recorder in the central office makes a permanent record of the alarm and sounds a gong. This device may be connected to special conductors of a cable and used to advantage in preventing sabotage of expensive telephone plant.

* * *

RAY BLAIN

Without a doubt the chain hoist is one of the greatest general purpose tools in the telephone industry. This tool may be used to pull guys, wire and messenger strand with greater ease and safety than is possible with an ordinary block and tackle. Drive a digging bar in the ground and attach the chain hoist and a length of rope and you have a most effective pole straightener. With the aid of two short timbers it may be used to pull holes. By attaching a short length of strand or chain the hoist makes an ideal load binder for pole hauling on either a trailer or truck. No doubt you have found numerous other uses for your chain hoist, and if so we would be pleased to hear about it.

The chain hoist is shown in use as a pole load binder, one of its numerous uses.

* * *

We old-timers who have worked with heavy leads of open wire cannot but marvel at the speed cable networks are being extended over this land of ours. Last week-end on a motor trip out of Washington, D. C., we followed an aerial cable to Annapolis, Md., then across the bay on the ferry where the cable makes a submarine crossing. On the eastern shore, we again picked up the aerial lead and followed it for more than 100 miles south down to the lower end of that Maryland peninsula which separates the Atlantic Ocean from Chesapeake Bay.

* * *

There is undoubtedly a need for more standardization of equipment in the Independent telephone industry. This need is now brought home to many companies who are required to expand their plants on short notice due to national defense activities.

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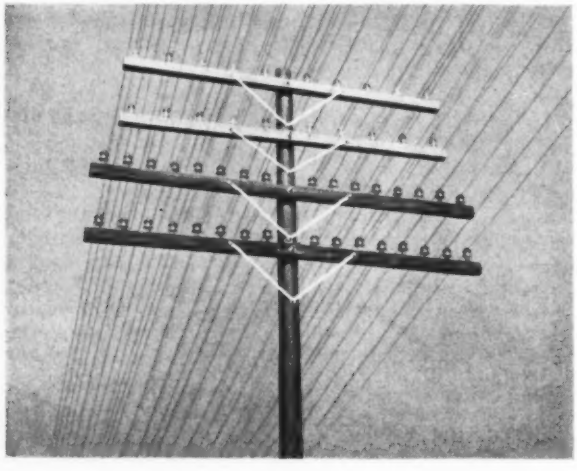
Most telephone companies seem to be of the opinion that when an additional section of manual switchboard is required, their manufacturer should be able to furnish it without delay. Actually this is not the case, for equipment of the same manufacturer generally differs so that it cannot afford to carry a large reserve of the numerous types in stock. Therefore, most orders must be made up special to meet numerous local conditions.

If it were possible for each manufacturer to standardize on one particular type of magneto and common battery switchboards, factory time could be utilized during slack periods to build up an adequate reserve stock of equipment with which to fill rush orders promptly during boom times.

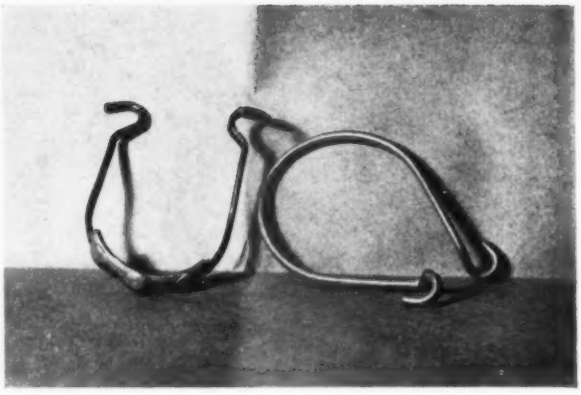
The basic switchboard sections only need be standardized as special line, trunk and cord circuits could be equipped as desired. One or two positions of this switchboard could be used as a non-multiple type and three or more to form a multiple type. Certainly the idea has merit and is worthy of consideration.

EXTRA PIN CROSSARMS. We have become so accustomed to crossarms with a maximum of 10 pins that we generally consider this the greatest number that can be used with success. In climates where sleet loading is unknown or light, a greater number may be used when desired. A crossarm with 16 pins spaced on eight-inch centers can be used successfully. To make a lead of this type successful the wires should be pulled to an exact level and to the proper tension. Then the wires will all swing together in a high wind and not tangle easily.

When 16 wires are strung on two or more crossarms a considerably greater strain will be placed on the lead and the poles should be selected accordingly. Guys and anchors should also be located with extreme care. Double crossarms should be placed on all corner and other poles where there is a considerable change in the grade of the line. In all such cases a single crossarm will not handle the strain of the 16 wires without bowing.



Crossarms with 16 pins can often be used in climates where sleet loading is unknown or light.



Ring on left shows the lead saddle in place. Ring on right, before saddle is formed.

* * *

The inventive manager of a midwestern telephone company sends in this cable ring "kink." An ordinary copper steel cable ring is used and a lead saddle is formed in place. These rings are used near poles and other locations where ring cuts are more likely to occur. We understand that cuts never develop under these rings where the lead saddle contacts the lead sheath of the cable.

These rings are made by melting old cable sheath, which is used to fill an improvised mold to form the saddle. Our manager friend advises that this is a good job for linemen while working in the storeroom on rainy days. Copper steel rings are used because the heat from the metal ruins the galvanizing on steel rings, thus causing them to rust after being in service only a short length of time. We are told these rings have been used for years with complete success.

* * *

SPARE FUSE HOLDER: Telephone men agree that keeping spare fuses on hand and ready for instant use is important. One telephone man has suggested that a rack be provided with suitable clips for holding two fuses of each size and capacity used in the exchange. These fuse holders should all be clearly stenciled with the capacity of the fuse it is to hold. This method will insure that a fuse of correct size and capacity will be available for instant use in any emergency.

As a further safety precaution, the spare fuse clips or holders may be wired in series so that a bell will ring or a lamp glow when one of the spare fuses is removed from the rack. This may be accomplished by connecting a suitable relay to the series circuit and passing a small current through the fuses to hold the relay in an operated condition and its contacts open. When a fuse is removed from the rack the relay is released which causes the contacts to make and close a local circuit to ring a bell or light a lamp or both.

This arrangement will prevent an attendant from replacing a defective fuse in the rack, to be grabbed when a good one is required to replace one which blows from overloading in a working circuit. To restore the alarms to normal the rack must be kept filled with good fuses. Also this alarm arrangement will insure that all spare fuses are maintained in perfect condition at all times.

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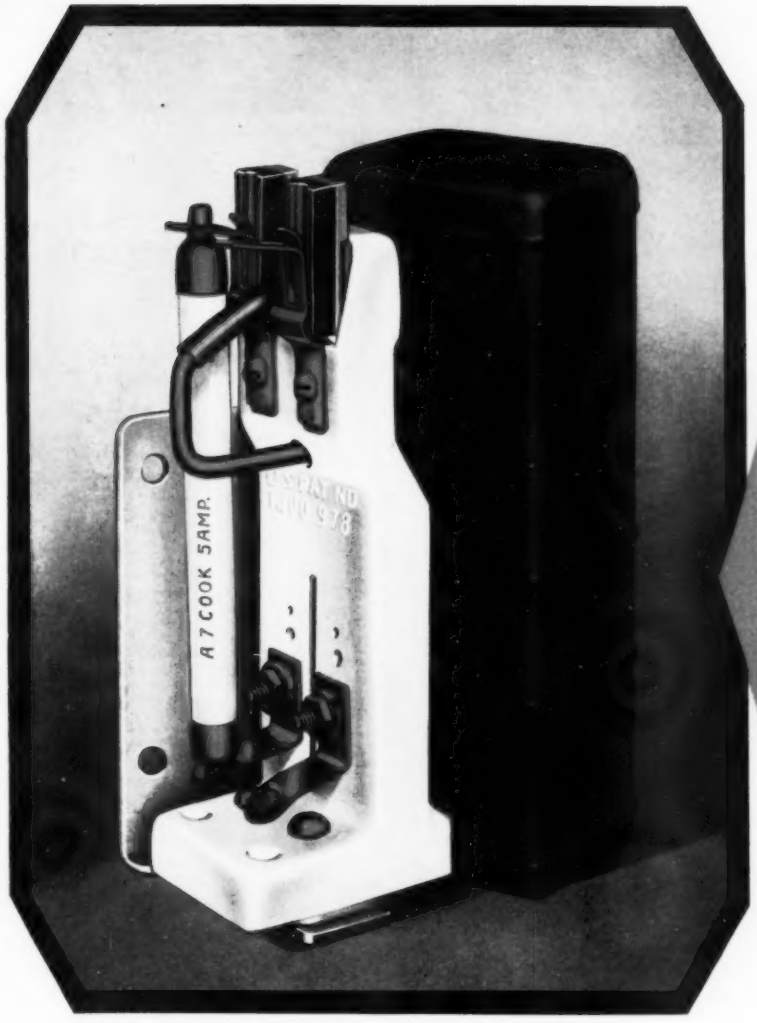

TAKE A LOOK AT THIS SUB-STATION PROTECTOR

THESE ARE THE FEATURES YOU SPECIFIED

Your suggestions showed that you wanted a sub-station protector with these distinctive features:

1. A compact universal protector suitable for both indoor and outdoor installation.

2. Arresters equipped with non-grounding dischargers. (Tru Gap discharge blades of phosphor bronze have a .007" air gap and discharge at 930 volts A.C. (median). Carbons are precision ground.)

3. A strong highly glazed white porcelain base having moisture absorption quality of less than ¼ of one per cent. Designed to provide maximum creepage surface between conductors.

4. A sturdy welded Everdur cover which is constantly and positively grounded. The cover must be held in position and grounded by a heavy Everdur spring and ground terminal which also prevents cover vibration.

5. Tension retaining phosphor bronze fuse clips adjustable for the varying lengths and types of fuses.

6. Tamper proof cover lock is optional.

7. A self-centering mounting bracket of heavy hot dipped galvanized steel which permits separate installation of the bracket and turning of the protector unit on the bracket for convenient wiring and servicing.

8. An overall design which permits faster, easier, and neater installation.

The Type "O" Sub-Station Protector supplies all of the features you asked for, the more important of which are covered by U. S. Letters Patent No. 1,800,978; No. 2,171,350; and No. 1,668,310.

EXAMINE it closely . . . see if you don't agree that Cook engineers have created in the Type "O" Universal Sub-Station Protector the kind of economical, dependable protection *you* want.

Economical because it reduces maintenance costs . . . the elimination of one service call will offset many times the cost of one protector.

Dependable because the Type "O" cuts subscriber hazard and instrument damage to a minimum.

Take a look at the Type "O" today. Telephone equipment manufacturers and supply houses everywhere have it. Or better yet, send for a free sample.

COOK ELECTRIC COMPANY • 2700 SOUTHPORT AVE. • CHICAGO

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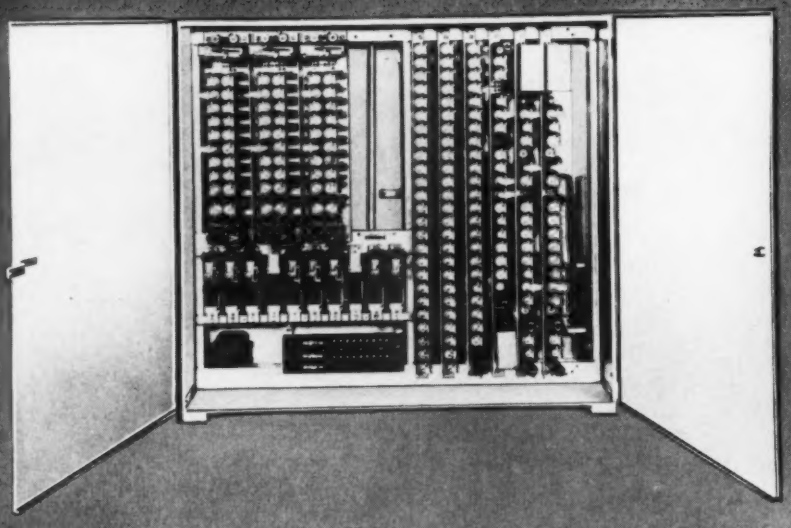
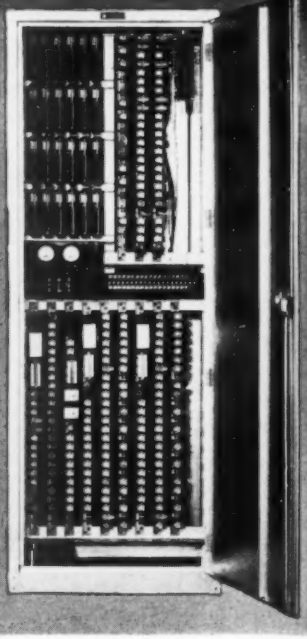
LIKE PUTTING MONEY



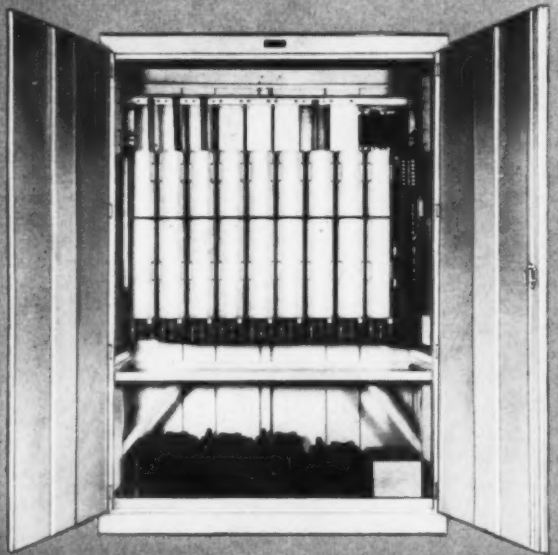


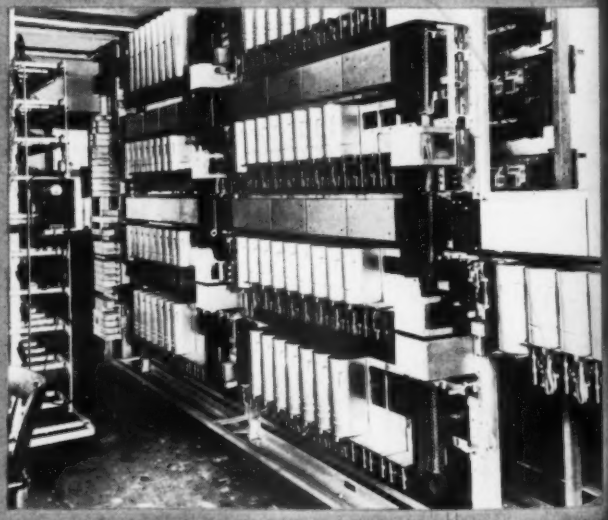
The Type 36A1 C-A-X has a capacity of 19 lines, 4 links and 3 trunks. It uses rotary linefinders and rotary connectors.

The Type 32A44 C-A-X serves either central battery or magneto telephones, and either metallic or grounded lines. It uses rotary linefinders and Strowger connectors, and with one unit has a capacity of 50 lines; with two units, 90 lines.

The Rotor Relay C-A-X uses the Automatic Rotor Relay and standard Automatic Electric "horizontal" relays. The capacity of the switchboard shown here is 30 lines, 4 links and 5 trunks.

The Type 35E97 C-A-X ranges in capacity from 100 to 800 line circuits. It employs Strowger linefinders, selectors and connectors.





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EY IN THE BANK!

These small AUTOMATIC ELECTRIC switchboards will actually save money for you because they appreciably reduce operating costs, and at the same time provide better service to your subscribers . . . .

No matter how small your exchange may be, there's an Automatic Electric C-A-X to fit your requirements. And since they operate on a totally unattended basis, savings in operating costs are considerable. Adoption of Automatic Electric small exchange equipment offers a thoroughly dependable, proved means of putting your small exchange operation on a sound financial basis, regardless of fluctuations in labor costs during the years to come.

Furthermore, Automatic Electric C-A-X's provide the finest type of modern, 24-hour dial service. Old subscribers appreciate the improvement, and their enthusiasm stimulates the interest of new prospects and aids materially in signing up new users. Practically every small locality which adopts Automatic Electric equipment, experiences an increased demand for new installations and a definite up-trend in volume of traffic.

As indicated in the accompanying illustrations, Automatic Electric engineers are not limited to one type of automatic equipment, but are free to recommend whatever type will be most economical and serviceable under any specific conditions. Their recommendations are based on fifty years of the most extensive small exchange experience in the Independent field, and you can rest assured that when you buy an Automatic Electric board it will (1) fit your conditions perfectly; (2) have adequate amounts of equipment; and (3) save you money from the day of the cutover. Write for further information—today!

AUTOMATIC ELECTRIC

ORIGINATORS AND DEVELOPERS OF STROWGER STEP-BY-STEP MACHINE SWITCHING AUTOMATIC DIAL SYSTEMS

MAKERS OF TELEPHONE SIGNALING AND COMMUNICATION APPARATUS
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Distributors in U. S. and Possessions:
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The Operator's Corner

By MAYME WORKMAN
Traffic Supervisor
The Illinois Telephone Association

WHEN A CUSTOMER places a long distance call, he is privileged to talk for a specific period of time, termed the "initial period," for a stipulated charge. If the customer's conversation extends beyond this so-called initial period, he is required to pay an additional sum known as the "overtime charge."

Rates for long distance service are based upon airline mileage. The day station-to-station rate is the basic rate.

Charges for overtime are based upon the initial period rate. For example, if the day station-to-station rate is 40 cents for the initial period, the overtime rate for each additional minute is 10 cents; if the day station-to-station rate is 80 cents for the initial period, the overtime rate is 25 cents for each additional minute.

On person-to-person calls, the charge for overtime is also based upon the initial period rate but there is a second reduction in the overtime charge if the calling party talks over three minutes in addition to the initial period. For example, if the person-to-person initial period rate is 75 cents, the rate for the first three minutes overtime is 25 cents for each additional minute and, if the calling party talks longer, the charge for the next overtime period will be at the rate of 15 cents per minute.

Reduced night rates in effect from 7:00 p.m. until 4:30 a.m. are applicable on station-to-station calls on which the day station-to-station rate is over 35 cents and on person-to-person calls on which the initial period rate is over 50 cents. These reduced rates are also in effect on Sundays between 4:30 a.m. and 7:00 p.m.

Reduced rates, particularly on long-haul traffic, result in a considerable saving to telephone customers. On a station-to-station call where the day rate is $1.40 for three minutes, the night and Sunday rate is 85 cents for three minutes and, on a person-to-person call where the day rate is $1.85 for three minutes, the reduced rate is $1.30 for three minutes.

Reduced rates do not apply on calls to Mexico and to ships at sea. On overseas calls, lower rates are in effect between the hours of 5:00 p.m. and 5:00 a.m. on weekdays and all day Sunday, originating office time, to certain countries listed for reduced rate service in the Toll Rate and Route Guide instruction.

On overseas calls and calls to ships at sea only person-to-person rates apply, although station-to-station calls are accepted at person-to-person rates.

The time of day when conversation starts, determined in accordance with the time system (standard or daylight saving) legally or commonly in use at the originating place, determines whether the day, night, or Sunday rate applies on messages for points to which there are reduced rates, irrespective of whether calls are paid or collect. When conversation starts in one rate period and ends in another, the rate in effect at the time conversation starts applies to the entire message.

Long distance telephone service provides an adequate form of communication for the entire world. It carries the human voice over mountains and valleys, rivers and seas, to nearby towns and foreign soil with the speed of light and at a cost so reasonable it is in no way comparable to the value of the service rendered.

As telephone employes we may be justly proud of the communication service of today and of the pioneers who laid the groundwork for this magnificent service structure.

Questions from Illinois Operators

1. How do you charge for overtime?
2. What is meant by "rd"?
3. The charges were refused on a call from a paystation and the calling party requests the operator to make the report charge collect. What markings do you put on the ticket?
4. Is a call subject to a federal tax if there is a 25-cent messenger and a 25-cent report charge?
5. If a subscriber asks to be notified at the end of three minutes on a long distance call and you do so but he continues to talk, should you repeat?

The answers to these traffic questions are given on page 67.

Best Story of the Week; What's Yours?

From John Bonert of Jamesport, Long Island, N. Y., comes the story of a splicer, working in the office of a brokerage house, who had just completed a splice on one of the floor cables.

He was in the act of dusting the splice with desiccant before placing the sleeve over it. One of the stenographers, who happened to see this mysterious operation, walked over to the splicer and after looking on for a moment remarked: "Moths, eh?"

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ROEBLING

"Bridges a Century with Wire"

ROEBLING ELECTRICAL WIRES AND CABLES

100 years ago John A. Roebling founded the company which still bears his name.

» Today, after a century of service, the name Roebling is still synonymous with leadership in wire manufacture, improvement and application.

» In celebrating its 100th Anniversary, Roebling looks forward to the opportunity of serving the telephone industry in even greater measure than ever before.

JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY

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Iowa Independents Seek More Toll Revenue

(Concluded from page 36)

delivered by Miss Grace Coan of Denison. Miss Coan discussed the manner and routine of handling and recording collect station-to-station calls, person-to-person collect calls, collect report charge, collect calls requiring an "In ticket," two-ticket collect calls, and collect messenger charges.

A general discussion followed Miss Coan's talk.

Miss Margaret Grace, of Fort Dodge, prepared a paper entitled, "In My Garden," which was presented

In the traffic conference the cameraman found a guest speaker (left) MRS. MAYME WORKMAN, of Springfield, Ill., and MISS ANNE BARNES who planned and presided at the traffic sessions.

by Miss Izola K. Ormand, chief operator at Fort Dodge, when Miss Grace was unable to attend the conference.

Discourteous operators are "the smartweeds" in the garden-like telephone exchanges, the speaker said. "Other weeds in our garden are those operators who give out wrong numbers, file incomplete reports, fail to give the time and charges on calls or fail to notify customers when their initial minutes are up in long distance calls."

The thoughts expressed in the address presented a close comparison of a telephone exchange and flower garden. The early morning operator was compared with a spring beauty; the business firm operator was called the lovely pansy. The veteran operators were likened to "lilacs and other sturdy perennials."

"As in all gardening," said the speaker, "there must be tools to eliminate the weeds which might spoil the garden. Our tools are the supervisors," she said.

An open forum was held on the subject of (1) how to handle the switchboard cords and plugs, and (2) selecting and training operators.

Mrs. Mayme Workman, Springfield, Ill., traffic supervisor of The Illinois Telephone Association, and author of TELEPHONY's regular feature, "The Operator's Corner," gave a very interesting address on "Keystones." Pointing out that science and invention have revolutionized the mode of life in rural communities, making it comparable in many respects to that of the city dweller, Mrs. Workman stated that the invention of the telephone has ended the farmer's isolation. She enumerated some of the many uses for the telephone on a farm.

"The telephone exchange in a small village and its operators are keystones in the community," said Mrs. Workman. "They are supporting factors in the business and social life of the inhabitants. . . .

"The small exchange operator who underestimates the importance of her position is inclined to render inferior service. She will be inclined to use outmoded phrases. . . . Many small exchange operators are handicapped by lack of proper training. This training should be given when the operator is first employed and not several years later after she has acquired bad operating habits which are difficult to correct."

The speaker discussed the matter of declining telephone usage in rural communities, and possible reasons were advanced for this.

It was stressed that "inferior service not only destroys pleasing customer relations, but it also has a detrimental effect upon the growth of the business. Inferior service is difficult to sell. Good customer relations and the quality of the service rendered are frequently determining factors in securing necessary rate increases."

Mrs. Workman's address will be published in a future issue of TELEPHONY.

The last number on Wednesday's program was a discussion of arrangements of operating schedules by D. C. Bowman of Des Moines. Mr. Bowman exhibited charts showing the operator's proper schedules for exchanges requiring (1) six operators including two reliefs, (2) seven operators including two reliefs, and (3) one operator on duty at all times. The charts were very well prepared and will be helpful to chief operators in preparing schedules in various sized exchanges.

The last session on Thursday morning was given over to an open forum and questions and answers on several phases of traffic work. A moving picture on "Training Operators" was also shown.

Judging by comments of operators attending the meeting, this year's traffic conference was one of the most profitable ever held by the Iowa association and all highly praised Miss Barnes for arranging a program which will prove so valuable to operators in carrying out their future duties.

▼ ▼

Dialing at Random, Woman Gets Help

Dialing her telephone at random as she lay injured following a fall from a stepladder, Mrs. Elizabeth Dean, 75 years old, of Columbus, Ohio, happened to call the number of Charles Blackmore, living about a dozen blocks away. Mr. Blackmore immediately notified the police.

A doctor sent to her home by the police gave Mrs. Dean first aid and then sent her to the hospital, where she was treated for a fractured left arm and possible back injuries.

Mrs. Dean had been washing the walls of her bathroom when she slipped and fell backward to the floor. Crawling on the floor, the aged woman was able to reach the telephone but could not find the directory, so she dialed, and by chance rang Mr. Blackmore's home.

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Air Conditioning the Exchange

(Continued from page 29)

The zone of comfort is closely associated with the effective temperature as it indicates the limits of effective temperature under which the body may be comfortable. Two zones of comfort must be considered—one for summer and the other for winter. The summer comfort zone has a higher effective temperature than does the winter zone. This may be explained by the fact that the body accustoms itself to slightly lower temperature in winter than in summer.

Humidity in the Exchange

Humidity is a term used to represent the moisture content of air and natural air always contains some moisture. Air at a given temperature will carry a certain amount of moisture in vapor form. When air contains the maximum amount of moisture, it is said to be saturated and the only possible means of increasing its moisture content is by raising the temperature.

When the temperature of saturated air is lowered it can no longer retain all of its moisture and a part of the vapor will be condensed. From this we learn that raising the temperature of air increases its moisture carrying capacity and a lowering of the temperature reduces the moisture it may contain.

Natural outdoor air ordinarily has a relative humidity of about 50 per cent or about one-half of its moisture carrying capacity. Before a rain when the air feels damp, the relative humidity is always high and may approach 100 per cent which is its maximum. When outdoor air is especially dry, its relative humidity may be lower than 50 per cent, but it will never reach zero, since before this point is reached the air will pick up moisture from somewhere due to the drying out of materials or the vaporizing of water.

Air at 70° F. may carry as much as 110.5 grains of moisture per pound while at zero it can carry only 5.47 grains per pound. The zone of comfort may generally be considered between 30 to 80 per cent relative humidity although 80 per cent is ordinarily considered excessively high for the proper maintenance of telephone equipment, but more about this later.

Air Movement and Cleaning

Air movement and cleaning plays a most important part of any telephone air conditioning system. Due to the high static pressure which usually accompanies recirculation of air the centrifugal-type fan equipped with multiblades is generally used to provide the necessary air movement.

Air filters are available in a variety of designs although all serve the same purpose—that of removing dust from the outside air as it is drawn into the system.

The filters most commonly used are the dry mat and the revolving oil types. The dry mat variety is usually made up in sections about 20 inches square and two inches thick. The filter sections are filled with porous or fibrous material such as hog bristles or fiber glass which may or may not be coated with a non-evaporating liquid so that dust particles will be caught as the air passes through the filter. These sections are mounted snugly in suporting frames and each has a capacity of from 800 to 1000 cubic feet of air per minute.

The revolving oil filter consists of a curtain or screen which rotates slowly through a filter bath of specially prepared oil of a non-volatile character. The accumulated dust is washed off the curtain in the oil bath and it emerges clean and ready for reuse.

Atmospheric dust usually consists of microscopic particles of sand, metal, ashes, soot, fiber, chemicals, animal and vegetable matter and various disintegrated materials. The dust particles vary in size from the painful cinder that gets in one's eye to particles so small that several millions of them would be required to cover the head of a common pin.

The quantity of atmospheric dust varies in different sections of the country and is highest in congested business sections of our larger cities where it averages about .6 grains per cubic foot of air. While dust and air impurities of all types prove detrimental to the proper maintenance of both manual and automatic telephone equipment, the most harmful of all is fibrous material which may average from 3 to 5 per cent of atmospheric dust in most localities. Fibrous matter or lint accumulates on relay contacts and forms an insulating film which is most difficult to remove.

Theory of Operation

The operation of air conditioning equipment for either summer or winter conditioning is extremely simple. For summer operation, the fan pulls air in through the intake, cleans it by passing through the filter, then cools and extracts a part of its moisture by passing through the cooling coils.

In winter the air is drawn in, cleaned, heated, moisture added and then is circulated. For both summer and winter operation, the greater part of the air is recirculated for the sake of economy. Recirculation is used to reduce costs which prohibit the conditioning of all outside air and exhausting it after circulation through the building only once.

It has been found that air from the exhaust is more nearly correct as to temperature and humidity, also cleaner than outside air. For this reason, it is much easier to condition this exhaust air than a new supply from the outside. There is a limit, however, to recirculation of air and if exceeded, results will be bad and odors objectionable.

The cooling of the coils is accomplished by the use of a suitable gas, usually "Freon-12." This gas is compressed and cooled in the condensing unit until it becomes liquid. The liquid is then piped to the conditioning unit where it is permitted to expand and evaporate in the cooling coils absorbing heat from the surrounding air as it does so. The gas is then returned to the condensing unit, compressed, and used again.

The condensing units are generally evaporative or water-cooled types although air cooling may be used in some cases when desired. The conditioning units require a small drain pipe to carry off surplus moisture extracted from the air. Thermostatic control may be arranged so that the condensing unit stops and starts automatically when necessary to maintain a predetermined temperature, or it may be manually controlled.

Various Types Available

The central type and the unit type of air conditioning system are both commonly used in telephone

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exchanges. The unit machines are built in various types and designs for winter, summer and year-round air conditioning. These unit machines are especially designed for use in smaller telephone exchanges.

They may be supplied with heating and cooling mediums from outside sources or may have a small compressor and heater inclosed inside the housing. Fans are used to circulate the air over the cooling surface and a pan is provided to collect the moisture which is condensed on the coils. These units operate best when a part of the air supply is taken from outside the building although many operate on 100 per cent recirculation.

The central air conditioning system usually has all refrigeration equipment installed in the basement and a main duct system conveys the cooled air to each room. Thermostatic control on dampers may be used to regulate the air flow into each room.

Another method used which is a compromise between the unit and the duct systems just mentioned is one where the refrigeration equipment is installed in the basement, but small individual units condition each floor or rooms as desired. These individual units are supplied with cold water or refrigerant from the central system. The system which best meets all local conditions at the lowest cost should be considered for telephone use.

The standard type of air conditioning system will prove entirely suited for telephone use with only a few modifications. The air duct systems in a manual exchange should be of sufficient size so that the air movement will not cause excessive noise. A low sound level in manual operating rooms is always desirable and this condition is materially improved by closing and sealing all windows when air conditioning is used.

There is no need of trying to overdo cooling such as attempting to keep the temperature inside the exchange 25° F. below the outside temperature on a hot day. A 10-degree temperature differential will ordinarily prove adequate in most climates. In extremely humid climates, the excessive moisture may cause low insulation, electrolytic action, and break-down troubles in the telephone equipment unless air conditioning is used. This may prove true despite the fact that enamel insulated wire is used and all coils are properly impregnated.

While a relative humidity of from 45 to 55 per cent may be maintained with modern air conditioning, it is doubtful if 65 per cent or higher will prove harmful and it will certainly prove less costly to maintain.

Air cleaning is most important for the telephone exchange. For this reason, filters of an approved type and of ample capacity should be procured. These filters should then be properly maintained in order that an adequate supply of clean air may be available at all time. It will be surprising how the proper control of humidity and correct air cleaning will reduce maintenance work and costs in any telephone exchange.

We do not claim that this article covers nearly all that could be said about air conditioning. While we have merely touched the high points, it is hoped that this article will give telephone men some idea as to what may be expected of modern air conditioning and how it may be used to advantage in the present day telephone exchange. The necessary detailed information and costs for any type of air conditioning system can be obtained from any recognized dealer or manufacturer of this equipment.

Begin Construction with Safety

(Continued from page 33)

found on the stems of poison sumac, and serve to distinguish it from the non-poisonous variety.

Poisoning from these plants is usually more frequent when the skin is wet with perspiration; however, direct

Illustration showing proper (left) and wrong ways of using pike pole.

contact is not needed for infection, as some individuals are affected by merely passing near a growth of the vines.

Just as soon as possible after exposure to poisonous plants or vines, the exposed areas of the skin should be cleaned thoroughly with five or six washings of warm water and thick soap lather. A brush or sponge should not be used as this will tend to set up an irritation.

Follow the soap bath with rubbing alcohol, then rinse with clear water and let the skin dry. If, in spite of this care, a rash or redness appears, apply a two per cent carbolic acid solution of calamine lotion, which you may obtain at any drug store. Shake this solution well, and pat it on with a small cotton pad.

Incidentally, recovery from one attack of poison ivy does not provide immunity from further contagion. This first aid treatment is not intended to dispense with a physician's services, but quite often the severity of most cases may be lessened by the proper care.

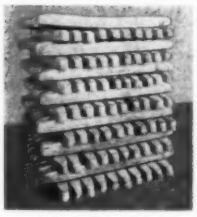
This is very true in cases of small cuts and wounds. First aid kits should be a part of the regular equipment in trucks and central office buildings and they should always be used in cases of emergencies.

One more thing we should try to avoid in spring construction work is the substitution of one tool for another, as, for instance, using a screwdriver for a chisel, pliers for a hammer, or the most common one, using a digging shovel for a pike pole. There are several other so-called dangerous time-saving devices and ideas, but these are the most common.

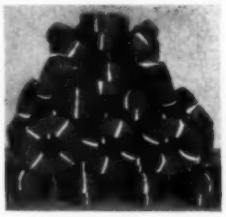
Let's all help each other this year and see if we can make 1941 free of avoidable accidents.

It can be done!

XUM



FROM COPPER BAR TO FINISHED WIRE



Under PHILLIPS' *Control!*

One of the main reasons for the consistently high quality of Phillips Wires and Cables, is that Phillips performs in its own modern plant all processes from copper bar to finished product.

The Phillips plant is now considered the most modern and comprehensive of its kind in the world. Its processes are based on long experience and modern research. To pass final inspection, Phillips products must meet the most rigorous tests.

No wonder engineers everywhere consider Phillips wire and cable tops in performance and long life! Every form of conductor required in telephone, communication and signal work can be supplied by Phillips. Write for prices—today!

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DRIERITE

The Modern DESICCANT FOR DRYING CABLE SPLICES

DRIERITE dries the Cable Splice by positive absorption of all moisture from wires, insulation, bandage and surfaces inside the sleeve. Application is easy and rapid.

The snow-white granular **DESICCANT** is neither poisonous, corrosive nor abrasive, and does not evolve gas, fume or odor either in storage or in use. It eliminates all chance of fire, accident or discomfort to workmen or occupants of buildings.

STANDARD PACKAGES

1/8 Pint Can (50 grams) 48 per Carton.
1/2 Pint Can (200 grams) 12 per Carton.
1 Quart Can (800 grams) 12 per Carton.

For sale by the Manufacturer and leading telephone supply houses.

W. A. HAMMOND DRIERITE COMPANY
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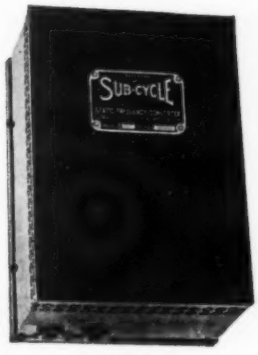
BETTER RINGING SERVICE

SUB-CYCLE

The MODERN Method of Ringing



Model "S"

PRICE $45.00

Designed for offices up to 1600 stations.

Exclusive Features

No Moving Parts
Nothing to Adjust
Economical Operation
Quiet

Six Models for Loads Ranging from the Small PBX to the Large Central Office.

Prices $32.00 to $93.50

Also Pulsators

Write for Literature

LORAIN PRODUCTS CORPORATION
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Sold by Leading Distributors

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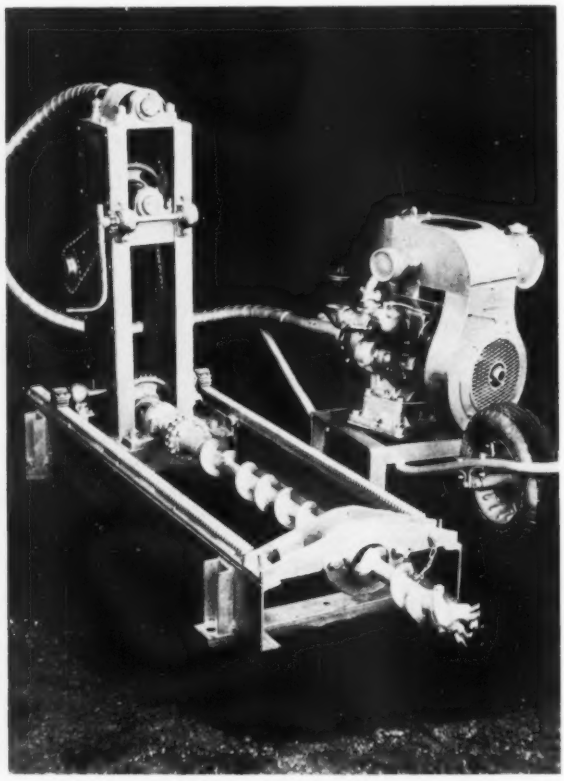
Horizontal Drills

(Continued from page 25)

When a hole has been bored under a street or other obstruction to connect two sections of open trench the installation of conduit is a comparatively simple task if approached in a proper manner. It is possible to couple the conduit and slide it through the hole, if the front end is protected to prevent the entrance of loose



One type of earth auger ready for use.

dirt. Perhaps a better method is to place a rope or wire through the hole bored by the drill. This line can then be threaded through the conduit as each new section is added. Care should be exercised to keep all joints in the conduit tight during installation, to avoid trouble should it ever be necessary to replace the cable.

The horizontal type drill may also be used to advantage for the installation of tape-armored cable. It is best not to pull this type of cable through a hole drilled for a distance of 50 feet or more. The friction of the earth on this type of cable will cause the sheath and the conductors to stretch which will pull the paper insulation apart and cause short circuits, crosses and grounds. A rope and hitch may be used to equalize the strain and prevent injury to tape-armored cable when installed in this manner.

It is believed that these drills may be utilized in numerous ways in any telephone exchange. Used properly, we are certain that they will prove a worth while

One type of auger used for drilling under streets. Note sections of auger piled at side of trench.

investment for all telephone companies regardless of their size.

In the Nation's Capital

(Concluded from page 27)

One other passage in President Gifford's statement to the A. T. & T. stockholders was not lost upon FCC staff members in charge of the pending long lines rate investigation. This was where Mr. Gifford took issue with the FCC over the manner in which it suddenly launched its three-pronged query scheduled for hearing on June 9.

Mr. Gifford said he was "disappointed that the commission should see fit, especially at this critical time, to depart from the practice which it has followed in the past of handling rate matters by informal conference with the company." This procedure, he asserted, "the commission has noted in its annual reports and other public statements, as being productive of results without the necessity of legal proceedings."

An explanation which may or may not underlie the latest FCC technique was discussed last week in this department. The difference seems to be that in the past the FCC was satisfied with results without legal procedure. In the future, it may be more keen about legal procedure than results.

Incidentally, the vice president and chief engineer of the A. T. & T., W. H. Harrison, who has been serving in Washington for some time as an important cog in the Knudsen-Stettinius operations, was recently given an important new responsibility under the lease-lend law. Mr. Harrison will be the chief liaison officer between the Office of Production Management and the Navy Department and Maritime Commission. The appointment resulted from a letter to Secretary of Navy Knox from John D. Biggers, OPM officer in charge of production. The letter stated that Harry Hopkins, in charge of the lease-lend program, had requested OPM to appoint a liaison officer to handle naval and merchant marine operations of the lend-lease program. Mr. Harrison's appointment has been accepted by Secretary of Navy Knox.

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POWERS
PUBLIC UTILITY BODIES

TELEPHONE BODIES

DESIGNED PARTICULARLY FOR

ALL-PURPOSE SERVICE

Compartments are designed to accommodate all necessary equipment, test sets, tools and material — eliminates loss and breakage — crews can operate safely and efficiently.

WRITE FOR COMPLETE CATALOGUE OF AUTOMOTIVE EQUIPMENT FOR TELEPHONE COMPANIES.

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SINCE 1871

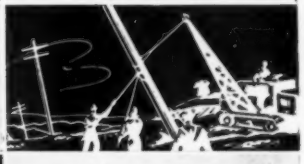
Illustration: One of the McKrae Telephone Company Fleet.

Amertel

ALREADY AN ESTABLISHED NAME IN THE TELEPHONE AND TELEGRAPH FIELD

Amertel lowers construction costs

Amertel lowers maintenance costs



Amertel offers added strength (Minimum breaking strength—No. 12 B.W.G.)

Amertel-135 grade	1213 lbs.
Amertel-85 grade	793 lbs.
Amertel B.B. grade	476 lbs.

Amertel has greater safety factor—withstands heavier ice and wind loads

Amertel has increased transmission efficiency at voice-frequency.

Amertel makes longer spans possible

Amertel-135 grade	350 ft.
Amertel-85 grade	225 ft.
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THE name Amertel, even though it is hardly over a year old, has already established itself as a leader in Telephone and Telegraph wire economy. The most important improvements embodied in Amertel-85 and Amertel-135 are illustrated here, and a glance at these developments should convince you that it will be well worth your while to fully investigate the many advantages Amertel can offer you. Our distributors are in a position to supply you with Amertel-85 and Amertel-135 Telephone Wire as well as the regular grades "EBB" — "BB" and "Steel."

AMERICAN STEEL & WIRE COMPANY

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UNITED STATES STEEL

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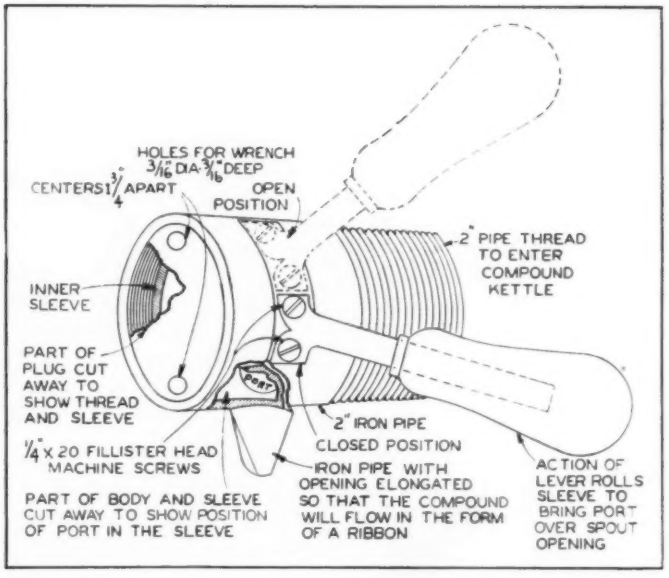
SPECIAL STOP-COCK FOR *Compound Kettle*

By JOHN BONERT

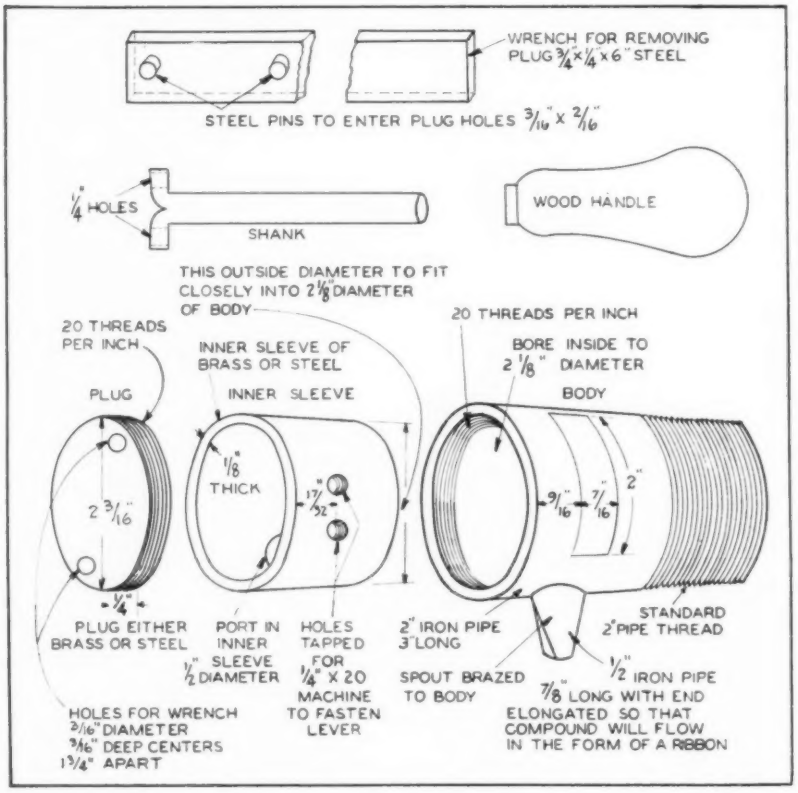
How one cable man hit upon a method for making his work easier

INSULATING compound used for filling insulated cable joints and terminals was formerly heated in small compound kettles. With the introduction of the large sealed-chamber terminals it was soon found that the average compound kettle would not hold a sufficient amount of compound for this purpose.

Sealed-chamber terminals were first supplied with cable stubs of standard lengths. However, it soon became evident that conditions in the field required stubs of various special lengths. Use of these special stubs often saved the cost of an extra cable splice, and the larger telephone companies arranged to make up sealed-chamber terminals in their own shops so that stubs of various lengths could be readily obtained.


HOLES FOR WRENCH 3/16" DIA 3/16" DEEP
CENTERS 1 3/4" APART
OPEN POSITION
2" PIPE THREAD TO ENTER COMPOUND KETTLE
INNER SLEEVE
PART OF PLUG CUT AWAY TO SHOW THREAD AND SLEEVE
PORT
1/4" X 20 FILLISTER HEAD MACHINE SCREWS
2" IRON PIPE CLOSED POSITION
IRON PIPE WITH OPENING ELONGATED SO THAT THE COMPOUND WILL FLOW IN THE FORM OF A RIBBON
ACTION OF LEVER ROLLS SLEEVE TO BRING PORT OVER SPOUT OPENING
PART OF BODY AND SLEEVE CUT AWAY TO SHOW POSITION OF PORT IN THE SLEEVE

How the individual parts are assembled to form the completed stop-cock.


WRENCH FOR REMOVING PLUG 3/4" X 1/4" X 6" STEEL
STEEL PINS TO ENTER PLUG HOLES 3/16" X 2/16"
1/4" HOLES
SHANK
WOOD HANDLE
THIS OUTSIDE DIAMETER TO FIT CLOSELY INTO 2 1/8" DIAMETER OF BODY
20 THREADS PER INCH
INNER SLEEVE OF BRASS OR STEEL
20 THREADS PER INCH
BORE INSIDE TO 2 1/8" DIAMETER
PLUG
INNER SLEEVE
BODY
1/8" THICK
17/32"
2 3/16"
9/16"
7/16"
2"
1/4"
PLUG EITHER BRASS OR STEEL
PORT IN INNER 1/2" SLEEVE DIAMETER
HOLES TAPPED FOR 1/4" X 20 MACHINE TO FASTEN LEVER
2" IRON PIPE 3" LONG
STANDARD 2" PIPE THREAD
SPOUT BRAZED TO BODY
1/2" IRON PIPE
7/8" LONG WITH END ELONGATED SO THAT COMPOUND WILL FLOW IN THE FORM OF A RIBBON
HOLES FOR WRENCH 2/16" DIAMETER 3/16" DEEP CENTERS 1 3/4" APART

Dimensions of parts for the special compound kettle stop-cock described by Mr. Bonert.

Such work did not require any special equipment in our shop except a large compound kettle heated by a gas burner. This kettle was first equipped with an ordinary stop-cock to drain the compound into the sealed-chamber terminals. The stop-cock proved troublesome, however, as the passage through it was small, which caused the compound to cool and clog. Also, the compound often granulated due to continued heating. Various types of ordinary stop-cocks were tried, but none proved adequate for the job.

This problem was finally solved by the use of a special stop-cock as illustrated in the accompanying sketches and which was designed by the writer. This stop-cock has numerous special features which make it especially adaptable to this type of compound work. It has no small passages through which the compound must flow and the outer shell is of sufficient capacity to permit

XUM

some circulation of hot compound and maintain it in a liquid state. The port of the inner sleeve cuts the flow of the compound close to the opening of the short spout which reduces the after drip to a minimum. The end of the spout is elongated so that the compound flows in a flat stream which facilitates the filling of a terminal.

This special stop-cock has also been designed so as to permit easy cleaning. A special wrench, illustrated in an accompanying drawing, permits ease of dismantling so that all parts may be cleaned. Thorough cleaning once a week is recommended when the kettle is heated daily. This particular stop-cock has been in service for several years in our shops and is still giving perfect service. Any machine shop can construct the stop-cock and mount it in its compound kettle by carefully following the drawings reproduced.

▼ ▼

Senators Lecture to Class by Telephone

The shade of Alexander Graham Bell sat in a Columbia University classroom one morning recently and saw his invention drafted into academic service. A youthful lecturer was on the telephone discussing legislative practice and current issues with a United States Senator, and an amplifier wafted the senator's conversation to 67 students.

The lecturer, Dr. Kenneth W. Hechler, who conducts his course in "American Legislative Procedure" with an eye to realities, makes it a policy to invite political leaders to lecture to his classes whenever they can contribute first-hand knowledge of the subject under discussion. He found recently, however, that spare time in Washington was increasingly rare. So, on his own initiative and at his own expense, he had the telephone and amplifier installed in his classroom in the school of business.

Explaining his plan to the curious students, Dr. Hechler called for questions to be put to the "guest lecturers," Senators George W. Norris of Nebraska and Josh Lee of Oklahoma.

Then he lifted the receiver and told the Columbia switchboard operator, "Go ahead on the Norris call." For three suspenseful minutes he outlined a contrast between the Nebraska Independent and the Oklahoma New Dealer. Suddenly the telephone rang. The loudspeaker rasped, and Mr. Norris's voice flowed into the room, tinny but distinct.

The long distance toll mounted for 20 minutes while the senator answered questions about filibustering, the cloture rule, the two-party system, Nebraska's unicameral legislature, the war and the convoy question. The questions exhausted, he rang off, and another call brought Senator Lee to the rostrum for 15 minutes.

Dr. Hechler said he plans to call numerous legislators in Washington and in state capitals later in the term. The students, who will be held responsible for what they hear through the amplifier, were enthusiastic about the idea. Some of them were thinking of chipping in to defray part of the telephone bills.

▼ ▼

Five Telephone Exchanges at Texas Army Post

With the installation of a 1,000-line semi-automatic switchboard in the main telephone office at Fort Bliss, Texas, the post telephone exchange will have facilities to handle from 12,000 to 15,000 calls per day, officials at the post have reported.

Five exchanges now serve the army post, with the main office at Fort Bliss proper. Other offices are in the William Beaumont Hospital, in a newly-constructed post hospital, in a cavalry brigade area, and in an anti-aircraft cantonment.

Four women operators will be employed at the main office during peak periods, while enlisted personnel will handle the outlying exchanges. In all, approximately 40 operators will work the five boards during 24-hour periods.

JELLIED

By MISS ANNE BARNES

Traveling Chief Operator, Iowa Independent Telephone Association, Des Moines

"THE WORLD is a scene of change; to be constant in nature were inconstancy."—Cowley. This quotation reminds me of an old tree in front of our home which was a blaze of golden beauty last fall, especially when the western sunlight of late afternoon shed a soft glory through boughs laden with golden leaves and transformed the tree into a huge bouquet. Every day we looked for a change, and in looking realized that there was an alteration, though it came so gradually, it was hardly perceptible. It stood bare through the winter, but spring is now bringing new life to the branches.

Nature performs so surely and so quietly that we do not see the continuous gradual change. She does not *hold back* or *restore* in order to retain beauty out of season. But with an artist's delicate touch, she transforms every tree, bush, and slightest bit of shrubbery into a more beautiful thing than it seems to have been before, because she beautifies it in keeping with the current season.

What a pity we do not trust Nature to care for us during the different seasons of our lives! Would there be any reason for us to be less attractive as we grow older if we accepted Nature's changes gradually as they come to us—especially in the fall and winter seasons of life?

How fearful we become about losing the bloom of youth! How terrified we are of growing old! We resort to facials, hair tonics, hair dyes, and daintily-scented cosmetics, when all we actually need to do is *to be our age*. Dress as befits our seasons of life and pay more attention to staying young mentally than in wearing too youthful attire that only looks incongruous! This goes for men as well as women.

I read a story several years ago about a noted young beauty who by some trick of nature never faded in any season of her years; even in the winter time of her life she never lost her youthful beauty. In spite of this, her friends, then their sons and daughters, and finally their grandchildren, all tired of her imperishable beauty. When she arrived at the winter season of her life unchanged, the youthful generation did not wish to worship at the shrine of the woman who had been courted by their granddads half a century before.

"In this world of change naught which comes stays, and naught which goes is lost."

MORAL: People who refuse to change—when changes come—jelly.

XUM

There's something new under the sun every telephone man ought to know about! Find out now—

See PAGE 67

NEWS of the Industry

Company's Basketball Team Wins Top Honors

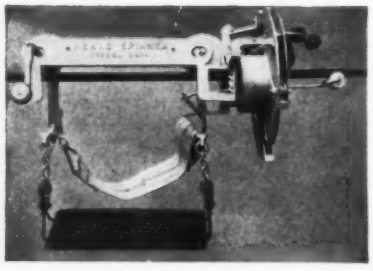
A smooth-clicking Missouri Telephone Co. employe basketball team came home first in the recently-completed season of the Columbia City League, General Manager W. N. Curtis reports. This is the second championship for the "Telco" team in recent months; last fall it won the city title in the softball league.

The telephone company's teams are composed entirely of bonafide employes, Mr. Curtis points out. No one is hired expressly to play for the teams. Members of the championship cage squad include Ralph Ganson, cable splicer; T. Hartley, cable splicer's helper; Bob Roark, plant accounting department; L. T. Dozier, lineman; Everett Conrad, plant superintendent; Noel Cunningham, construction foreman; Marvin Burnett, groundman; Whitney Weir, test desk; Jim Murray, lineman, and Joe Ottenschnieder, assistant plant superintendent.

A. I. E. E. Meeting to Hear Telephone Men

Three telephone men will be among the speakers at the communications session of the north eastern district meeting of the American Institute of

Basketball team of the Missouri Telephone Co., Columbia, Mo., which won the championship in the Columbia City League. The team also defeated an all-star team picked from 13 other teams in the league. Seated, left to right: RALPH GANSON, T. HARTLEY, BOB ROARK, L. T. DOZIER and EVERETT CONRAD. Standing, left to right: NOEL CUNNINGHAM, MARVIN BURNETT, WHITNEY WEIR, JIM MURRAY and JOE OTTENSCHNIEDER.



GO MODERN—

Discard obsolete methods—Take advantage of the new and accepted way of hanging cable—Use the NEALE one man Cable Spinning Machine and thereby avoid ring cuts, bowing and crystallization — It's economical and neat—Get complete information by writing a card or letter today to

NEALE MFG. CO.

Crane & Topeka • Topeka, Kans.

Electrical Engineers, to be held at Rochester, N. Y., April 30-May 2.

Dr. R. H. Manson, vice president of the Stromberg-Carlson Telephone Mfg. Co. will discuss "Communications in National Defense." He will be followed by Dr. George H. Town, Stromberg-Carlson engineer, who will address the meeting on "Unusual Applications of Electrical Engineering Principles in Television." "Some Considerations in the Design of Electromagnetic Relays for Use in Telephone Systems" will be covered in the talk by Oliver L. Angevine, Jr., another Stromberg-Carlson engineer.

One of the features on the program prepared for the meeting will be a tour of the modern Monroe exchange of the Rochester Telephone Corp.

▼ ▼

Section of Transcontinental Toll Line Expanded

A second toll line cable is being constructed by the long lines department of the American Telephone & Telegraph Co., between Oklahoma City and Tulsa, Okla. It will follow the route of the present Oklahoma City-Tulsa cable, will carry 150 wires, and will give about 40 additional telephone circuits, according to Warren S. Miller, general manager, Southwestern Bell Telephone Co. in Oklahoma.

The new cable will cost approximately a half-million dollars. It is expected to be ready for service by July of this year. The Oklahoma City-Tulsa cable section will be about 100 miles long and it is a part of an important trunk route west from St. Louis, and joins the "fourth transcontinental" route at Oklahoma City. This route to the coast passes through northern Texas, New Mexico, Arizona and has its terminal in Los Angeles.

Test boards and telephone "repeaters," which amplify the electrical currents, are to be installed at Oklahoma City and Tulsa, and also at Stroud, which is approximately midway between the two terminals.

▼ ▼

General Telephone Gains 4,097 Stations in March

General Telephone Corp. reports for its subsidiaries a gain of 4,097 company-owned telephones for the month of March, as compared with a gain of 3,100 telephones for March, 1940.

The gain for the first three months of 1941 totals 11,584 (exclusive of purchases) or 2.18 per cent as compared with a gain of 8,186 telephones or 1.63 per cent for the corresponding period of 1940. The subsidiaries now have in operation 543,627 company-owned telephones.

The efficiency of line construction and maintenance work, whether it be overhead or underground, necessarily depends a great deal upon the quality and design of the tools which are used. GRAYBAR'S long years of experience in meeting the tool needs of independent telephone companies, make it the logical source of specific tools for specific jobs. For, the tools which you buy from GRAYBAR have not only been designed for the job, but have also been pre-tested under actual field conditions.

Put your needs up to a GRAYBAR specialist. He's had long acquaintance with the experience of other users and can give you competent advice on your choice of equipment. GRAYBAR has more than 80 warehouses in principal cities throughout the country. Why not consider the nearest as one of your own? Whether you need a line construction truck or a roll of tape, you'll receive the same prompt, cooperative service.

Axes
Derricks
Diggers
Guy Clamps
Jacks
Ladders
Mandrels
Peavies
Pike Poles
Pliers
Pruners
Saws
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Tree Climbers
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GraybaR In Over 80 Principal Cities

GRAYBAR ELECTRIC COMPANY
Executive Offices:
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XUM

NEVER STAB a POLE in the BACK
• Deep stab holes have shortened the life of many costly poles by providing a place where moisture accumulates and rot starts.
Use the new MULTIPOINT CANT HOOK. Its six ¼" points hold more securely than a single long point—yet leave no deep, dangerous holes—in fact, they do not penetrate through the creosote treatment. Here is an easy and inexpensive way to eliminate injurious holes. Further, the new Multipoint Cant Hook gives greatly increased efficiency in pole handling—it grips more securely—spreads the strain over larger area—and more than that, it's self-releasing.
Safer and more efficient to use—will not injure costly poles. Made by The American Fork & Hoe Co., Cleveland, O.
STURDETOOLS
a TRUE TEMPER PRODUCT
STURDETOOLS
MULTIPOINT CANT HOOK
6 points ¼"x½" in size grip the pole securely but leave no deep hole to encourage rot and decay.
Furnished in small, medium and large sizes for handling poles up to 22" in diameter. Prices and complete description on request.
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JOSLYN MFG. AND SUPPLY CO.
Executive Offices
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Condensed News

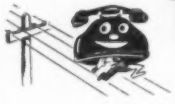
New Companies & Corporations

Waldron, Ind.—The Waldron Telephone Co., for many years owned and operated by Ray Jones, has been sold to Roy McDaniel, a lumber and coal dealer of Waldron. The new owner has filed articles of incorporation and requested a change in name for the company to the Home Telephone Co. of Waldron. Directors of the new firm are listed as Roy McDaniel, Anna M. McDaniel, Joel G. Barnes and Dillard E. Lee. The Public Service Commission of Indiana has been asked to approve the sale and to sanction a mortgage on the rights, powers, franchises, real estate and personal property of the company.

Marion, N. C. — The Marion Telephone Co. has been incorporated in the Carolina Mountain Telephone Co. system, Mrs. Edna Smith, former owner, has announced.

Cathlamet, Wash.—Telephone service on Puget Island, which was discontinued last November, has been resumed under the management of the Puget Island Telephone Association, composed of the residents of the island, who will pay $1.75 a month for service. The temporary switchboard will be located in the Lutheran Church of Our Savior. Within the next three months an automatic dial system will be installed.

Svere Pedersen is the president of the new association and Elmer Danielsen is the secretary-treasurer. The directors are John P. Berg, Harry M. Danielsen, and P. F. Jaspers.



Telephone Gains

Los Angeles, Calif.—The Southern California Telephone Co. had 807,824 telephones in service on March 31, a new high point for the territory and an increase of 4,731 during March. In the first three months of this year the company gained 17,589 instruments, compared with an increase of 12,794 for the corresponding period of 1940.

Battle Creek, Mich.—At the end of March the Michigan Bell Telephone Co. had 16,264 company-owned telephones in service here. The increase during the month was 254.

Columbus, Mo.—There are now 7,001 telephones in use here, according to J. H. Wright, commercial manager of the Missouri Telephone Co. The figure compares with 6,574 instruments in service a year ago.

New York, N. Y. — The New York Telephone Co. reported a March station gain of 11,427 telephones. This compares with a gain of 10,187 in March, 1940.

Columbus, Ohio—The Ohio Bell Telephone Co. reports a record-breaking total of 94,456 telephones in service here at the end of March. The gain during the month was 705, making the total increase for the first three months of the year 1,286 stations.

Youngstown, Ohio — A milestone in Youngstown's telephone history was reached recently with the installation of the 40,000th telephone by the Ohio Bell Telephone Co. The mark is 6,000 above the pre-depression high and 18,607 above the depression low of June, 1933.

Construction

Miami, Fla.—The Southern Bell Telephone & Telegraph Co. will spend $901,000 placing its long distance facilities underground, between Miami and West Palm Beach, the company has announced. The work is expected to be completed by December 1.

Cambridge, Ill.—Plans have been made by the directors of the Citizens' Mutual Telephone Co. here to improve the telephone system by installing 2,800 feet of underground cable this season.

Thomson, Ill. — The Northwestern Illinois Utilities Co. plans to install a dial system here during the summer and fall of this year. Plans are also under way for a similar installation at the company's Savanna exchange at a later date. All rural lines in the Thomson area will be metallicized.

Dunkirk, Ind.—A public meeting, at which representatives of the Eastern Indiana Telephone Co. discussed the proposed installation of dial telephones, was held recently here. The company has purchased land for a new building to house the central office equipment.

Hagerstown, Ind. — The Citizens

XUM

Telephone Co. has completed plans for a new central office building. New dial equipment to serve both town and rural subscribers will be installed.

Nappanee, Ind.—The Nappanee Telephone Co. has completed the installation of a stand-by generator to be used in case of power failure. The company has also finished the rehabilitation of the toll position of its switchboard, completing a four-year program of central office modernization.

Shippy, Mich.—At a recent meeting of the Farmers Telephone Co., plans for completely rebuilding the system with new wire were announced. The farm line connects with the Manton exchange of the Michigan Bell Telephone Co.

Hattiesburg, Miss.—Demands on the Southern Bell Telephone & Telegraph Co. brought about by activity at nearby Camp Shelby have necessitated the erection of a $185,000 office building here. It will be ready for occupancy about August 1.

Bellevue, Ohio—In order to construct a new $100,000 general office building, exchange and garage here the Northern Ohio Telephone Co. has purchased adjoining property. Construction is scheduled for this spring, with a cutover to dial service anticipated early in 1942.

Broken Bow, Okla.—The Callaham Telephone Co. is preparing to convert its magneto exchange to common battery operation. The company is also constructing 12 miles of copper wire toll line between Idabel and Broken Bow.

St. Paul, Ore.—The St. Paul Mutual Telephone Co. has shaped plans for installing automatic dial telephones and a new switchboard costing about $2,500. One of the oldest mutual systems in Oregon, the St. Paul company would become the first rural firm to install the dial setup in the state.

Scholls, Ore.—Conversion of the Scholls telephone exchange to dial automatic switching was announced by the West Coast Telephone Co. Crews have rebuilt and renovated all of the outside plant and have installed new switching equipment in the Scholls telephone building.

The Aloha exchange was converted to dial switching December 20. The next exchange in the area slated for a similar conversion is Sherwood, after which Beaverton, Stafford and Tigard will follow.

Springfield, Ore.—More than 420 telephones in the Springfield exchange of the Pacific Telephone & Telegraph Co. as well as 400 rural lines have been converted to dial operation. About 50 telephones on six rural lines will continue to be manually operated through the Eugene exchange.

Branchville, S. C.—The work of installing a dial telephone system here has just been completed by the Central Carolina Telephone Co.

(Please turn to page 63)

"Built By Nature"

Tens upon tens of thousands of years of development have gone into forming just the right taper and cell structure to make a cedar tree able to withstand storms and stresses that would demolish any man-made substitute.

Besides giving Cedars the ideal shape and internal structure for use as transmission and telephone poles, Nature has endowed these splendid trees with generous heartwood, copious with natural preservative that resists decay and insect damage.

"Treated By Naugle"

Careful selection in the forest, proper seasoning, and scrupulous inspection before shipment are but a few of the many steps Naugle takes to bring you the ultimate in true pole economy.

When a shipment of poles arrives at our Minneapolis yard, it passes through the most efficient handling and painstaking care that human ingenuity has been able to devise. Fifty-nine years' experience has taught Naugle the value of permanence: permanence in poles, and permanence in the confidence of pole buyers for three generations.

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MINNEAPOLIS "Since 1882" MINNESOTA

Reduce Costs OF TEMPORARY INSTALLATIONS WITH

KEARNEY NO-RENCH SCREW ANCHORS

Provides inexpensive guying of bracket or single phase ridge pin lines.

TIME and again temporary guying is demanded. Immediately, the operating man must think in terms of cost and time. Kearney No-Rench screw anchors, made of Certified Specification Malleable Iron, are 100% salvageable, because the rod and helix are one unit and may be screwed in or out of the ground conveniently.

They are efficient for permanent guying, too, having holding powers from 2,000 lbs. to 13,000 lbs., depending on the anchor size. Ideal for permanent anchorage where lawns or flowerbeds prohibit hole-digging.

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TELEPHONE ACCESSORIES for BETTER LINE CONSTRUCTION and MAINTENANCE

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With the Manufacturers

New Sag Calculator for Telephone Line Wire

A convenient, pocket-size calculator for determining the correct sags in stringing Crapo HTL-85 and Crapo HTL-135 high-tensile line wires has just been issued by Indiana Steel & Wire Co., Muncie, Ind.

The calculator covers a range of temperatures from 10 degrees to 100 degrees Fahrenheit. Span lengths in feet are shown for heavy, medium and light loading districts. Proper sags for any given span length can be quickly determined by setting the calculator at the existing temperature and reading the sag in inches on the slide chart.

The Crapo sag calculator—first instrument of its kind devised for the telephone industry — should prove a boon to construction foremen and linemen. Interested telephone men can obtain these calculators by writing the Indiana Steel & Wire Co.

New 12-1600 Kellogg Masterbuilt switchboard now in operation at Seymour, Ind.

New Switchboard Serves Seymour, Ind.

On a Saturday night, less than a year ago, about midnight in Seymour, Ind. (a city with a population of 7,300) the second floor of the building of the Indiana Telephone Corp. was humming with activity. Normally this is considered a quiet time but this particular Saturday was the night that the new 10-position Kellogg Masterbuilt switchboard was cut into service—to inaugurate a new, improved telephone system for the city and surrounding area.

Plans were made and every detail set

This Is 'GATORHIDE

The IRONITE TREE WIRE with the Reputation as the Toughest—Hardest—Rub-resistingest Ever Made

'Gatorhide was designed and fabricated especially for those drop wire installations through trees that cannot be avoided or cut. Comes in single and parallel pair conductors.

'Gatorhide Tree Wire gets its reputation for long life and economy from the superiority of the three protective layers over the standard IRONITE conductors.

1st —Insulation, 30% pure para rubber specification.

2nd—Inner Braid, two end, long fiber cotton, stearine pitch impregnated and closely woven.

3rd —Outer Braid, extra heavy seine twine, stearine pitch saturated and mica impregnated under high pressure.

Altogether a harder, tougher finish than you have ever before seen on a drop wire.

Order a coil of Genuine 'Gatorhide Ironite from your jobber and stop worrying about tree troubles.

Paragon Electric Co. 39 W. Van Buren St. CHICAGO, ILL.

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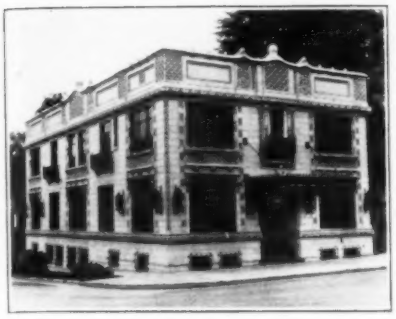

Office and exchange building of the Indiana Telephone Corp. at Seymour, Ind.

up in advance for the cut-over. Heads of various civic organizations and prominent business men were present and at 12 o'clock sharp the mayor threw the temporary switch which cut the new board into operation.

The ultimate capacity of the new equipment is 1600 lines. At present it is equipped with 900 common battery lines, 20 free toll lines, 20 common battery pay station lines. Each position has universal cord circuits arranged to connect to either magnetic toll or common battery lines or both.

Positions 1, 2, 3, 4 and 5 are universal toll operator's positions. Position 6 is the combined toll and local operator's position and positions 7, 8, 9 and 10 are universal local operator's positions.

Both the common battery and magneto lines have double lamp supervision. Machine ringing is provided on both common battery local and rural lines with revertive ringing tone to the calling party at each ringing period.

The Indiana Telephone Corp. now operates 32 exchanges in southern Indiana, having a total of 12,000 stations. The company has spent many thousands of dollars for the improvement of trunk and toll facilities throughout its system. In the city of Seymour, an up-to-date underground system covers practically the entire city.

The officers of the company are: P. F. Goodrich, president; J. P. Goodrich, secretary; W. J. Walsh, vice president; E. J. Smail, treasurer; W. J. Scheidler, executive vice president; E. S. Welch, operating vice president and R. V. Wasson, superintendent of construction. The men directly responsible for this improved service in Seymour are Messrs. Scheidler, Welch and Wasson.

Mr. Scheidler hails from Greensburg, Ind., and, although a comparative newcomer in the telephone business, he has made a host of friends in the field. He has always been active in public affairs and has been president of the Greensburg Rotary Club for the past four years, as well as being governor of the 156th district of Rotary International in 1939-40. He is executive vice president of the Public Telephone Corp., Greensburg and of the Batesville Telephone Co. In 1939 Mr. Scheidler was president of the Greensburg Chamber

Talking things over (left to right): E. S. WELCH, vice president in charge of operations of the Indiana Telephone Corp.; R. V. WASSON, plant superintendent, and HUGH HOGUE, Kellogg representative.

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TYPE 35 PROTECTED CABLE TERMINAL

For 11, 16, and 26 Pair Cables

Name the features that telephone men want most in a protected terminal. You'll get them all in a Type 35—including the SANDS self grounding and automatic resetting discharge block.

This block (Sands Type 2105) is standard on all SANDS protective equipment. With it, protection lapses are banished, maintenance costs are cut.

Write today for information.

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AMERICAN AUTOMATIC ELECTRIC SALES COMPANY
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of Commerce. He is a director of the Greensburg Y.M.C.A., director of the Union Trust Co. of Greensburg, and director of the Indiana Telephone Association.

Mr. Welch has had 40 years' experience in the telephone field. He began his telephone career in 1901 as a groundman for the Cumberland Telephone & Telegraph Co., Nashville, Tenn. In 1903 he transferred to the Southern Bell Telephone & Telegraph Co. as wire chief and later as chief inspector in the states of Alabama and Florida.

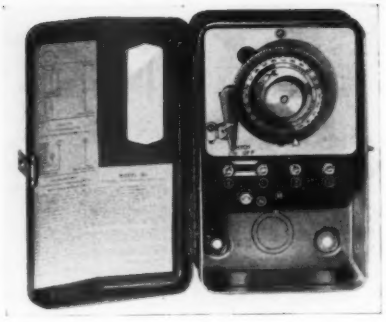
In July, 1908, Mr. Welch left the Bell company to go with the Central Home Telephone & Telegraph Co., as manager at Paducah, Ky. From there he went to the Interstate Telephone & Telegraph Co. at Aurora, Ill., as district superintendent, where he remained until 1914. For the next two years he served as general manager of the Glasgow (Ky.) Home Telephone Co. After this Mr. Welch was appointed general superintendent of the Southern Indiana Telephone & Telegraph Co., Seymour, Ind. When the company was reorganized in 1935 as the Indiana Telephone Corp., Mr. Welch became operating vice president.

Mr. Wasson worked his way up from a groundman and lineman in 1917 to his present position as plant superintendent. First he was a lineman with the Jennings Mutual Telephone Co., then maintenance man for the Southern Indiana Telephone & Telegraph Co. From there he transferred to the Madison (Ind.) Telephone Co., where he was wire chief and later manager. Then he became plant foreman at Seymour and later plant superintendent.

New Time Switch Announced by Paragon

Engineering research, coupled with large volume production, has provided continually improved products at successively lower prices in many fields—but nowhere more effectively than in the case of Paragon Electric Co.'s time switch, new 300 series. This is a high quality, precision instrument which sells at a reasonable price, the company states. It is the only time switch made with just two exposed gears; all others operate in a sealed oil bath and consequently are always lubricated, it is pointed out. It is not affected by dust, according to the manufacturer.

Operation is accomplished by a slow speed (450 R.P.M.) industrial type self-starting synchronous motor.



New Paragon time switch.

For actuating the off-tripper, the most difficult operation performed, there is a reserve power of 40 pounds or an equivalent of 2,000 per cent. It operates successfully at temperatures as low as 20 degrees below zero. The case is compact, made of 18-gauge steel with a seamless drawn cover and base, streamlined and modern throughout.

Copperweld Names New Representative

M. C. (Mike) Welch, formerly district superintendent for Georgia Power Co., Augusta, Ga., has joined the Copperweld Steel Co. staff in the south eastern district. He will represent the Copperweld company in Florida.

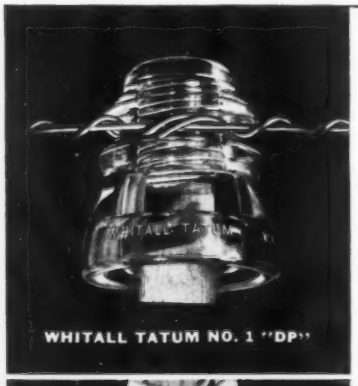
Hirsch Organization Acquires New Building

The Gustav Hirsch Organization, consulting engineers, and telephone and electrical contractors, whose offices for several years have been located at 209 South Third street in Columbus, Ohio (with warehouses and working departments located in different sections of the city), has acquired a factory and warehouse building at 310 West Broad street. This building will be occupied by all branches of the company's business, including its offices.

New Acoustic Steel Telephone Booth

Following the successful advent of the steel telephone booth, introduced a few years ago by the Sherron Metallic Corp., 1201 Flushing Ave., Brooklyn, N. Y., several improvements have recently been developed and incorporated which are of distinct advantage.

In this connection, the most important feature of the improved type of booth is the adaptation of an acoustic sound-absorbing lining, which effectually reduces the interference caused by exterior noises. In order to achieve this result, the booth is equipped with



WHITALL TATUM NO. 1 "DP"

FAMOUS "WT" BRAND INSULATORS WITHSTAND SEVERE TEMPERATURE CHANGES

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RAIN or shine—cold or warm—Armstrong's Whitall Tatum Glass Insulators withstand severe temperature changes without breakage or failure. The lower illustration shows "WT" Insulators undergoing a thermal shock test at Electrical Testing Laboratories, New York. For your protection, all Armstrong's "WT" Insulators are made to conform to A. S. T. M. standards. See your jobber or distributor for complete information, samples, and prices. Or write direct to Armstrong Cork Company, Glass Insulators Department, 295 Fifth Avenue, New York City.

WHITALL TATUM GLASS INSULATORS
MADE BY ARMSTRONG

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walls and ceiling which are covered with perforated metal linings and backed by a suitable acoustic sound-absorbing material.

Sounds entering the booth pass through thousands of small holes in the lining and are absorbed by the acoustic material, thus reducing the interfering effect of these noises, and thereby improving transmission and privacy of conversation.

It should be noted that the new acoustic booth takes up no more space than an ordinary booth of standard size. Dimensions are, 30 ins. wide by 30 ins. deep by 83¾ ins. high.

The construction features of the booth are similar to the standard booth manufactured by this company and are such that all vertical joints, both of the walls and linings, are of an interlocking type, which eliminates the use of screws, it is said.

The standard equal-leaf folding door is also used in the acoustic booth, where

Steel telephone booth incorporates acoustic sound-absorbing lining.

it augments the acoustic value of the booth. A new handle of polished, hard aluminum alloy is now used.

An important feature is the adjustable shelf and telephone instrument backboard unit, which slides on a tubular standard of improved design, through which the telephone wires pass from the top of the booth. The shelf can be set either at standing position or sitting position, as required.

A steel seat of new design, covered with rubber matching the floor tile, is provided and is readily installed or removed without drilling holes in the booth.

A specially designed light, located in the ceiling, throws maximum illumination on the telephone instrument. Access to the fixture for purposes of lamp renewals is obtained through a flat, tilting lens frame which automatically returns to normal horizontal position. The lens, being flat, provides increased head-room in the booth.

Adequate ventilation is assured by the installation of a compact electric ventilating unit located between the ceiling and roof. Being thus concealed, it does not detract from the appearance of the ceiling, yet provides an ample circulation of air throughout the booth, the company points out.

Both the light and ventilating unit are automatically controlled by a noiseless switch which is operated by the opening or closing of the door.

This modern booth is provided with a floor of heavy gauge steel, covered with high grade rubber tile, three-sixteenth in. thick, and is equipped with a stainless steel tread only three-eighth in. higher than the building floor. This type of floor is thus easily cleaned and protects the building floor from dirt and wear.

The lines of the acoustic booth are plain and simple and are consistent with modern interiors.

All booths are finished in high grade baked enamel and may be supplied in single colors or combinations of colors in order that they may harmonize with the surroundings.

The acoustic booth can also be supplied, at extra cost, with wall and ceiling linings of stainless steel which improve the general illumination of the booth interior. The base is also available in stainless steel.

This improved acoustic booth, modern in every detail, should help telephone companies increase pay station revenue, the company states. Research has proven that public telephones produce greater returns when located in a modern and comfortable booth. From this standpoint, it is not a luxury, but a necessity.

For further information and prices, apply to the Sherron corporation, manufacturer of this steel booth.

▼ ▼

Large Increase in Net Shown by Western Electric

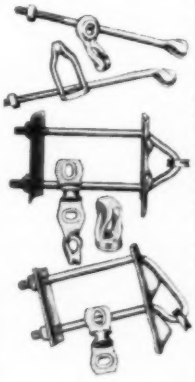
The 1940 annual report of the Western Electric Co., Inc., made public by its president, Clarence G. Stoll, shows a net income for the year after all expenses and charges of $32,787,030. This was equal to $5.46 a capital share, and compares with a net of $16,476,086, or $2.75 a share, in 1939.

The company earned 12.3 per cent on its average investment last year, compared with 6.7 per cent in 1939. Average return on investment for the last ten years was 3.3 per cent.

Western Electric's volume of business in 1940 was the largest in ten

"This is a cinch! Half the job is done on the ground . . .

. . with THIMBLEYE guying fixtures."



Guy attachment is much simpler and easier when Chance Thimbleye guy fixtures are used. Guys may be made up on the ground ready to mount on the pole. Attaching the guy to the pole is then much quicker and easier than the old wrap around method. The hazard of loose flying ends of cable is eliminated and several feet of strand are saved on each installation.

GET FULL GUY STRENGTH

The Chance drop-forged Thimbleye permits guy strand to be pulled through or wrapped around the thimbleye groove without kinking, bending or breaking. The strand retains its full cylindrical form and is not weakened by distorted or broken strands. Compare the smooth contour of the strand in the thimbleye with the unnatural bends and strand separations in the ordinary eye.

Thimbleye guy fixtures make it safer to depend on guy strand to carry its recommended load.

Chance Thimbleye guy fixtures may be used individually or in a variety of combinations.

Manufactured and distributed by these licensees—

Hubbard and Company.....Pittsburgh, Pa.
Joslyn Mfg. & Supply Co.....Chicago, Ill.
Line Material Co.....Milwaukee, Wis.
Oliver Iron & Steel Co.....Pittsburgh, Pa.
Kortick Mfg. Co.....San Francisco, Cal.
Seyler Mfg. Co.....Pittsburgh, Pa.
Copperweld Steel Co.....Glassport, Pa.
Utilities Service Co.....Allentown, Pa.
Electrical Mfg. Co.....Battle Creek, Mich.

Order from your regular source of supply.

Manufacturer & Licensor

A·B·CHANCE CO. CENTRALIA MISSOURI

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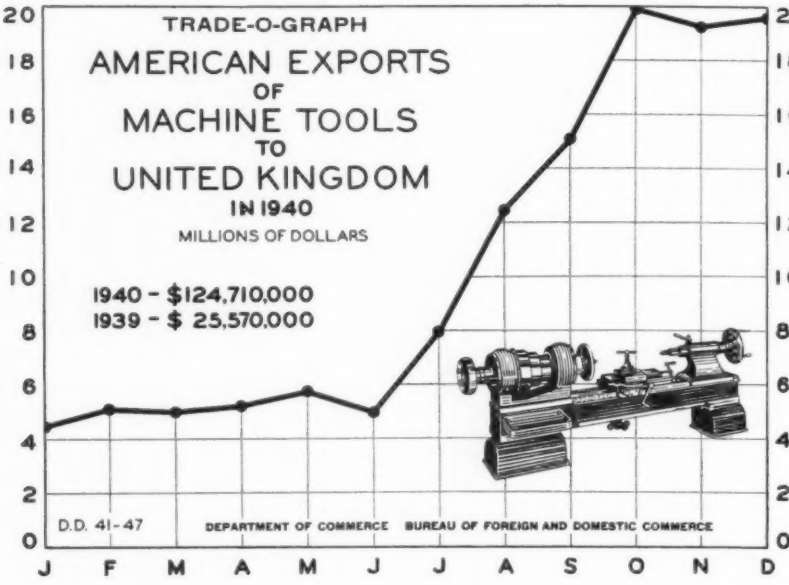
years, according to the report. Sales by the company aggregated $241,618,000, an increase of 29.3 per cent over 1939. Sales to the Bell System constituted 94.2 per cent of the total.

Taxes paid in 1940 amounted to $14,840,000, an increase of $6,402,000, or 75.9 per cent, over 1939. Taxes required 31.2 per cent of net earnings before taxes, according to the report, and were equal to 5.4 per cent of the average investment and to $7.97 a week for each worker employed.

At the directors' meeting held March 11, a dividend of 75 cents per share on the common stock was declared. The dividend was paid March 31 to stock of record at the close of business March 26.

Guy W. Vaughan, president of the Curtiss Wright Corp. and the Wright Aeronautical Corp., was elected a director of the company. George B. Proud, assistant treasurer, was elected treasurer, to succeed Frederic H. Leggett, who retired April 1 after 43 years of service.



New High Power Portable Lamp Unit

The Carpenter Mfg. Co., Cambridge, Mass., has recently developed a new high power portable lamp unit. Known as the type J2 Master-Light, it uses two No. 6 dry cells and features a cast aluminum case with a polished aluminum handle, a rubber lens guard, a high-quality five-inch reflector and a powerful bulb. The new product is said to project an exceptionally wide and powerful beam of light.

The case of this new Master-Light incorporates a mounting bracket. The lamp measures 10 inches high, and weighs 10 pounds with batteries. This

There's no "compromise" when you buy Orangeburg NOCRETE, for no other conduit can offer all its advantages at its low cost.

First, NOCRETE provides *complete* cable protection — prevents cable corrosion. And this protection is practically *permanent*, for this conduit is essentially everlasting —is immune to electrolysis and soil corrosion. Of equal importance, Orangeburg NOCRETE is so strong that it requires no concrete encasement.

And—NOCRETE offers economy—*plus*. Its cost is about half that of metal pipe and less than that of non-metal pipe of comparable quality. Then—because it handles easier, assembles and installs faster than any other conduit, its total savings are well worth investigation.

Sales Agent—Distributors
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NOCRETE CONDUIT

MADE AT ORANGEBURG, NEW YORK, BY THE FIBRE CONDUIT CO., 292 MADISON AVENUE, NEW YORK CITY

ORANGEBURG *Standard* for installation *with* concrete encasement.
ORANGEBURG NOCRETE for installation *without* concrete encasement.

Use of Vacuum Tubes in Telephone Work Is Increasing. Learn About Them From

FUNDAMENTAL ELECTRONICS AND VACUUM TUBES

By ARTHUR L. ALBERT
Professor of Communication Engineering, Oregon State College

Discusses the principles of electronics and the theory of vacuum tubes, photocells and copper-oxide varistors in radio and in telephone circuits. Stresses both the theory of these devices and the design and operation of circuits in which they are used. The book is non-mathematical and of practical value to those in engineering and operating branches of telephony.

422 Pages — 6 by 9 in. — $4.50

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608 S. Dearborn St., Chicago
WABash 8604

High power portable lamp unit projects a wide, powerful beam of light.

light is an improvement over all similar units, the company states. It is said to be especially suitable for emergency lighting purposes.

▼ ▼

New Device for Persons Hard of Hearing

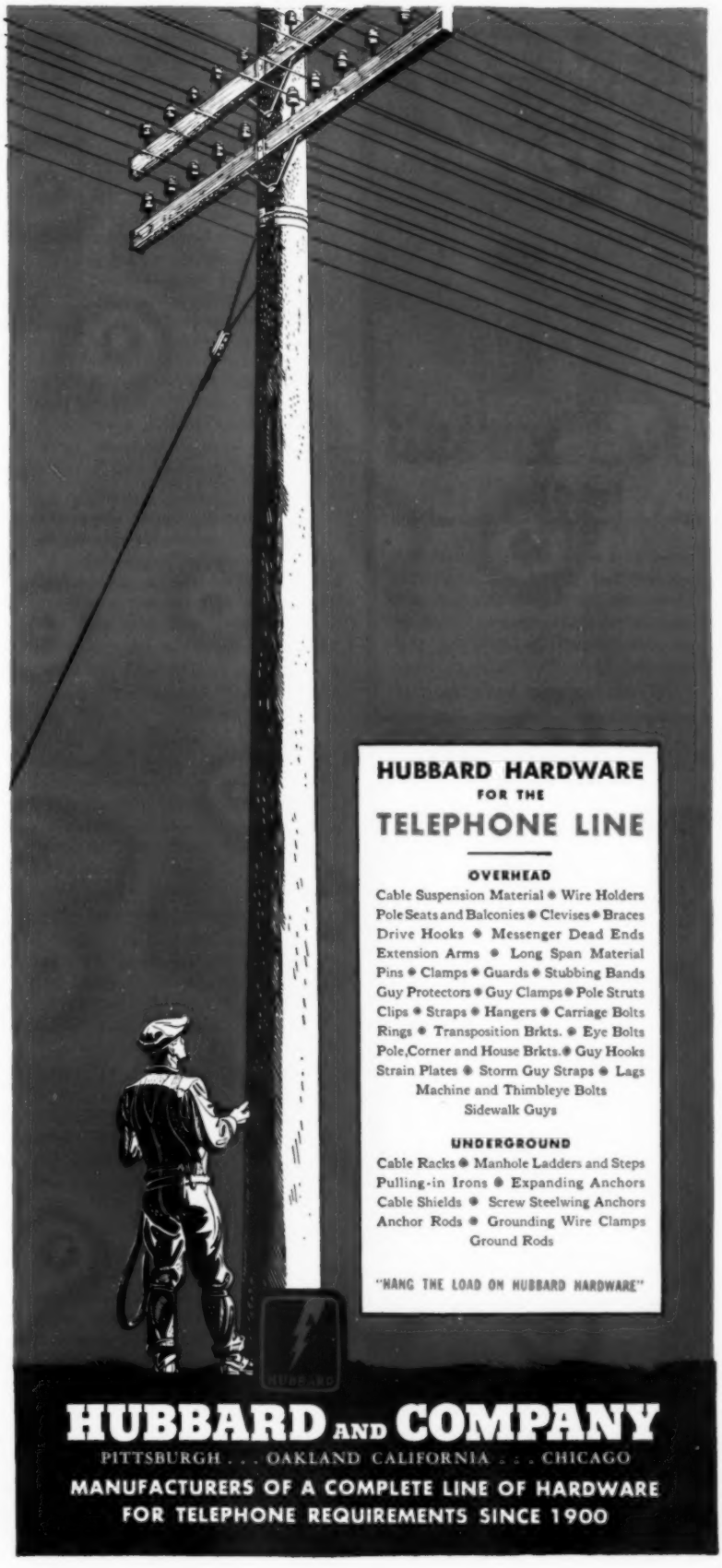
A new instrument for the hard-of-hearing that utilizes, in miniature, vacuum tubes and essential circuits found in the most advanced broadcasting stations to reproduce for the failing ear speech sounds and every important tone of the symphony orchestra, has been announced by the Western Electric Co.

Not only can the new device amplify sound far above its normal intensity but it can amplify the various portions of the musical range by different amounts. Tones heard very poorly may be greatly re-enforced and those heard fairly well may be amplified only a small amount. Thus the "Ortho-tronic Audiphone," as the new instrument is called, can compensate admirably for individual types of hearing deficiency.

The audiphone has been designed so that nearby voices or distant music get ample re-enforcement. The "shock effect" of loud noises, however, is eliminated.

The device also gives the wearer control in noisy places against the possibility of certain noises being amplified and interfering with the speech. At the flip of a small switch annoying rumbles and deep vibrations fade out while essential speech sounds pass unhampered. Another control regulates volume or loudness. At the touch of a finger, this control can build up the sound to adequate loudness or cause it to fade into silence.

The ortho-tronic audiphone uses two of the major developments of radio,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Cable Suspension Material • Wire Holders
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Clips • Straps • Hangers • Carriage Bolts
Rings • Transposition Brkts. • Eye Bolts
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UNDERGROUND
Cable Racks • Manhole Ladders and Steps
Pulling-in Irons • Expanding Anchors
Cable Shields • Screw Steelwing Anchors
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PITTSBURGH . . . OAKLAND CALIFORNIA . . . CHICAGO
MANUFACTURERS OF A COMPLETE LINE OF HARDWARE
FOR TELEPHONE REQUIREMENTS SINCE 1900

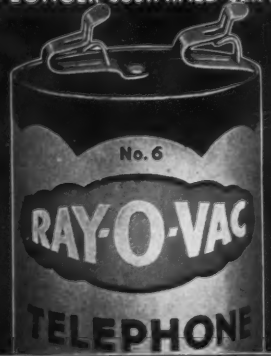
EVERSTICK ANCHORS...

Speed and ease of installation are features that crews and engineers appreciate in Everstick Anchors. Nut housing locks, anchor firmly on rod — entire unit is installed and expanded in a minimum of time.

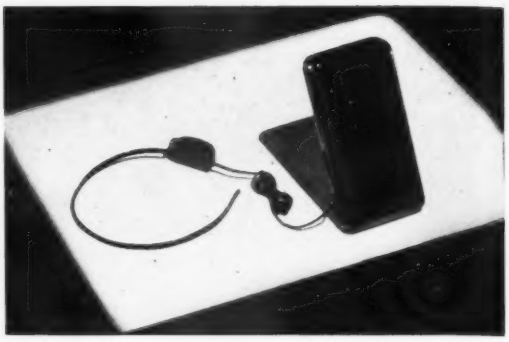
Write for new bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

WE USE RAY-O-VAC BATTERIES FOR LONGER SUSTAINED SERVICE



RAY-O-VAC COMPANY
Formerly FRENCH BATTERY CO.
MADISON - WISCONSIN



This tiny case houses an ingenious sound amplifier, known as the "Ortho-tronic Audiphone." Sounds entering its grilled front actuate a crystal microphone, are boosted a thousand-fold by finely-wrought vacuum tubes, and emerge natural and clear to drive the miniature ear-piece shown on the left.

the pentode vacuum tube and the "stabilized feedback" circuit. These two developments coupled with unique instrument design features give the ortho-tronic audiphone its unusual performance.

As refined for use in the audiphone, the vacuum tubes correspond in size with a peanut. They require a small amount of current and have an estimated life of several thousands of hours. In combination with the stabilized feedback circuit, the tubes amplify sound clearly with no change in naturalness throughout the useful life of the batteries.

The new instrument may be likened to a miniature one-way telephone. A small disk-shaped crystal microphone, which is concealed in an amplifier slightly larger than a cigarette case, picks up the sound and transmits it to the amplifier in the form of electrical vibrations and finally through slender, moisture-resistant cords to a miniature receiver.

The receiver converts the electrical impulses into sound vibrations of sufficient volume to compensate for the individual's loss of hearing. This receiver is of the magnetic type and may be coupled with the hearing mechanism by either the "air conduction" or "bone conduction" method. If the former, it fits into the ear; if the latter, it rests against the head behind the ear.

The crystal microphone is stabilized for both temperature and humidity. Hence the wearer is assured of natural hearing during winter or summer regardless of extremes in the weather.

The ortho-tronic instrument may be worn as an item of apparel or, if desired, concealed under the clothing. Rounded contours and harmonious simplicity characterize its appearance.

▼ ▼

BOOK REVIEW

STORAGE BATTERIES, third revised edition, by George Wood Vinal; 464 pages, 9¼ ins. by 6 ins.; 170 illustrations and 60 tables; published by John Wiley & Sons, Inc., New York City; price, $5.00.

This edition will be useful to telephone plant men who wish to have a knowledge of the theory, materials and methods of manufacture, operation and testing of storage batteries. While the book will be of special interest to plant men in the larger Independent exchanges, it contains material which should be valuable to officials of many smaller offices.

The chapters on methods of manufacture and electrolytes cover thoroughly the processes used in making lead-acid, Edison and nickel-cadmium cells, as well as the production of sulphuric acid and alkaline electrolytes.

Other chapters explain the theory of reactions, energy transformation and voltage; factors determining battery capacity; resistance; efficiency, and storage battery applications. Of particular interest is the chapter on operations, wherein are discussed methods of charging, charging equipment; regulation, and sources of trouble.

In this third edition, much new material and illustrations have been used; the last chapter, dealing with present-day uses for storage batteries, has been entirely rewritten. It includes a section on telephone batteries. The author is a physicist on the staff of the Bureau of Standards in Washington; he has made liberal use of the bureau's research data.

▼ ▼

Service Restored After Fire Sweeps Exchange

Service has been restored in temporary quarters by the Illinois Commercial Telephone Co. following a fire which destroyed the company's exchange, as well as a shoe store in the business district at Johnson City, Ill.

Couriers were used to summon fire departments from nearby towns after the telephone office had been destroyed. A third building in the block was seriously damaged, and other structures were threatened before the blaze was brought under control.

Condensed News

(Continued from page 55)

Etowah, Tenn.—A dial system, replacing the old magneto equipment, was placed in operation here on March 15 by the Southern Bell Telephone & Telegraph Co.

Elections

Woodbine, Ill.—At the 37th annual meeting of the Woodbine Mutual Telephone Co., the following directors were elected: Leon Arnold, Herwald Evans, John Heidenreich, August Siemen, and Everett Read. Leon Arnold was chosen to serve as president for the ensuing year, Herwald Evans is vice-president, and Albert Hartwig, secretary and treasurer. It was voted to purchase a new switchboard.

Markle, Ind. — The Majenica Telephone Co. stockholders elected Charles E. Paul and Clyde Smith, of the Markle district, Sherman Sprowl and John W. Boyer, of the Majenica district, and Harry Bonewitz, of the Mt. Etna district, as directors.

Peterson, Iowa—H. W. Roggow was elected president of the Spring-Brooke Rural Telephone Co. at the reorganization meeting of the group. Chris C. Felton, Jr., was named vice-president; W. F. Tigges, secretary, and Adolph Tigges, treasurer. W. H. Amendt, Willard Kracht, Jesse Fastenow and August Tigges were elected to the board of directors.

Sully, Iowa—L. W. Maasdam was re-elected president of the Sully Telephone Association at the annual meeting of stockholders. Gys Van Wyk was elected vice-president, succeeding Simon Vander Pol; and Vander Pol, Robert Castorf, William Lanser and A. J. Terlouw were re-elected to the board of directors.

E. C. Kruseman, C. Veersteegh and G. Van Wyk are directors whose terms did not expire this year. The association was reported in good financial shape, despite heavy expenses incurred recently because of sleet storms and metallicizing of rural lines.

Ute, Iowa—All 1940 officers were re-elected at the annual meeting of the Valley Telephone Co. They include Fred Linke, president; and Fred Mahler, Ferdinand Schelm, Charles Mohn, W. L. Temple, Brady Riddle and Carl Klaus, directors.

Allen, Mich. — Fred Newman and Frank Grover were re-elected directors of the Allen Mutual Telephone Co. at the recent annual stockholders' meeting. The directors renamed their officers for 1941, as follows: President, E. A. Moore; vice-president, Homer Dush; secretary, J. W. Watkins; treasurer and manager, Claude D. Keller.

Kaleva, Mich. — All officers of the Kaleva Telephone have been re-elected for 1941. They are: President, Charles Dodt; vice-president, Emil Rengo; secretary-treasurer, Harry Dodt; manager, Howard Robinson.

Rost, Minn.—Officers and directors of the Rost Telephone Co. were elected at the annual meeting. Directors re-elected by the stockholders were Gust A. Milbrath, Edgar Ulbricht and Alvin Glaser. At the organization meeting of the board, Alvin Glaser was elected president; Gust A. Milbrath, vice-president; and L. H. Grussing, secretary-treasurer.

Central Howell, Ore.—Lee Dow was elected director of the Silverton Highway Consolidated Telephone Co. at its annual meeting held here. Mr. Dow's term will be for three years.

Will Roth was made president; George Plane, vice-president; Frank W. Way, secretary-treasurer; with Ernest Ross and A. B. Cowden as additional directors.

Odds & Ends

Abilene, Kans.—The auditing department of the United Telephone Co., which has been located in Clinton, Mo., since 1936, will be transferred here effective May 1.

Four employes of the company will be moved to Abilene. They include W. H. Todd, head of the auditing department; LeRoy Bergstrom, Dean Callahan and Gordon Grimes. The move is being made in the interest of efficiency and economy, it was stated.

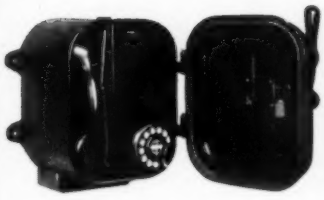
Redwood Falls, Minn.—At a meeting of the officers and directors of the Redwood County Rural Telephone Co. the by-laws were amended, dropping the word "rural" from the name of the company. Henceforth the organization will be the Redwood County Telephone Co.

Astoria, Ore.—Telephone customers in the Youngs river district discussed tentative plans for formation of a co-operative telephone company at a recent meeting with Prof. Paul Carpenter, Oregon State College marketing specialist.

The proposed cooperative, if formed, would take over lines now operated by a private concern. The community's growth makes need of an organization to regulate telephone service more acute, residents of the district said.

Lewis, Wis.—The Lewis Telephone Co. has been sold to W. E. Jorgenson of Spooner, Wis., by Walter Johnson of Siren, Wis., who purchased it about two years ago.

AN AE CP REVENUE PRODUCING SPECIALTY



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Taxi-stands, lumber yards, and factory grounds are typical places served by the Outdoor Monophone. Weatherproof, it is almost indispensable in exposed locations. It boosts your revenue because it commands an extra rental and serves subscribers who are now without telephone service. You can easily file rate schedules for this type of service.

Automatic Electric outdoor Monophones have sturdy all-metal cases. The door, lock-equipped, seals tightly against a rubber gasket. All wiring is rubber covered, and ringer and induction coil windings are impregnated with waterproofing compound.

Available for manual or automatic common-battery service, and for magneto operation. Write for complete details and prices.

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The 30 years that L-M engineers have given to building, testing and improving pole line hardware and construction specialties can help you to give better service at greater profit now. For these 30 years of L-M line construction research today bear fruit in a complete line of telephone construction specialties that will hold your lines up and keep your costs down year after year. Specify L-M in your next hardware and specialties order.

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AMERICAN AUTOMATIC
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Letter From London

WHAT it means to be a trans-atlantic telephonist in these days is graphically told in a recent letter from a girl in London's trunk exchange to one of her friends at overseas service headquarters in New York, according to a story in the March issue of the *Indiana Telephone News*.

When you come back to duty, writes the London operator, the first question asked is "Did you sleep in a real bed?" instead of the usual greeting of "Did you have a good time?"

"On our late duty," the letter says, "we are unable to get home now owing to raids. Under our new part of the building we have large refuges and we have down there about 210 beds, real hospital beds. Each girl has two blankets and a pillow. Frequently there are 260 girls, because if the girls off at 6 can't get home, back they come.

"It then means three girls in two beds. Which, for the middle one who has to sleep on the ridge, is not so good.

"We have our supper (sandwiches and tea), and breakfast given to us when we stay overnight. Then we are there for 8 o'clock duty in the morning. We work alternately late and early, as the travelling is difficult from some districts. We have very jolly times sometimes, all sitting around on beds eating sandwiches and drinking cups of tea.

"If we want to go to the pictures, we have to go Saturday afternoon and get home before dusk. That's all right as long as you don't have any shopping to do, but as all shops close about 5 or 5:30 now you have to maneuver to get your rations and your Sunday dinner."

When on early duty, the London operator says, "we nearly break our necks to get home in time to have tea and get into our siren suits before the warning goes. There is a truly horrible row going on overhead now, as I write."

She stated she was writing her letter in the "dugout" under the stairs of the basement of her home. "There is no heat; and the radio won't work well because the raid causes distortion."

Nevertheless, she sums up by saying, "We lead a very funny life at present" and "we contrive to make quite a pleasant evening."

"Flo has read this and doesn't think the censor will pass it," the letter concludes.

But he did. Indeed he has done little to interfere with the maintenance of the many friendships which have grown up between the operating staffs on either side of the Atlantic Ocean.

WISE SALES TIPS

Are Salesmen "Different"?

By W. L. HUDSON

THAT SALESMEN are a "different breed of cats" has often been heard. Do you believe it? I hope not, for it just can't be true. Reason it out for yourself. Everything connected with your life is essentially the same as everything connected with the lives of other people. You were born of the same kind of parents, reared in the same type of home, eat the same kind of food, attended the same type of school and have married, or will marry, the same sort of attractive girl.

Your emotions, ambitions, manners, ideals and tastes are, generally, the same as those of everyone else.

And so, as salesmen, let's throw off any illusion we may have that we are "different."

I think it is important to do so, for this reason. If we recognize the fact that we are the same as everyone else, we can, by studying ourselves, judge the reactions of others by what our own reactions would be under the same circumstances. Thus, after we have learned the circumstances of an individual prospect, we can put ourselves in his place and conduct all of our future dealings in a manner that would be satisfactory to us if the positions were reversed; and the chances will be very much in favor of a satisfactory transaction. This is important in sales work, don't you think?

To know yourself is to know others.

XUM

Commissions and Courts

SEC to Require Competitive Bidding

The Securities and Exchange Commission has adopted a rule requiring competitive bidding for all private and public offerings of new securities issues of more than $1,000,000 by utility holding companies and their subsidiaries.

Indiana Property Changes Hands

One hundred and eighty shares of common stock, representing the entire ownership of the Ladoga (Ind.) Telephone Co., have been sold to the John T. Detcheon interests of New Richmond, Ind. The stock was held by John M. Stanley and wife; Foster L. Stanley, a son; and an uncle of the latter. The deal was closed on April 14 but title to the property is retroactive to April 1.

John Stanley, the former owner and operator, is a pioneer in Indiana telephone circles. He celebrated his 40th anniversary in the telephone business last November. A serious automobile accident several years ago began for Mr. Stanley a period of ill health and major surgery. Complete recovery seemed assured but ten weeks ago he was again stricken and is now in a Crawfordsville hospital.

The Detcheon interests are the operators of several Indiana telephone companies, represented by 35 exchanges.

Extended Service to be Tried in Connecticut

The introduction in a number of Connecticut municipal areas of a new plan allowing telephone subscribers to make an unlimited number of calls to adjacent specified exchanges for an increased flat monthly rate is being considered by the Southern New England Telephone Co.

Joseph W. Alsop, chairman of the Connecticut Public Utilities Commission, announced that extended area service will be put into operation for the first time in Connecticut during May, when Stamford, Greenwich, New Canaan and Darien will be linked under the plan.

The service will be optional to subscribers and will eliminate toll charges for individual calls within the specified area for those who avail themselves of it. The present monthly rate for service within a single exchange will be increased somewhat to subscribers who elect to take the new service.

Directory Complaint Dismissed by Court

The district court at Nebraska City, Neb., has dismissed the action brought by the Lincoln (Neb.) Telephone & Telegraph Co. to enjoin the circulation of a directory of its subscribers in that area by the Parsons company. The court held that the telephone company had failed to show any material damages.

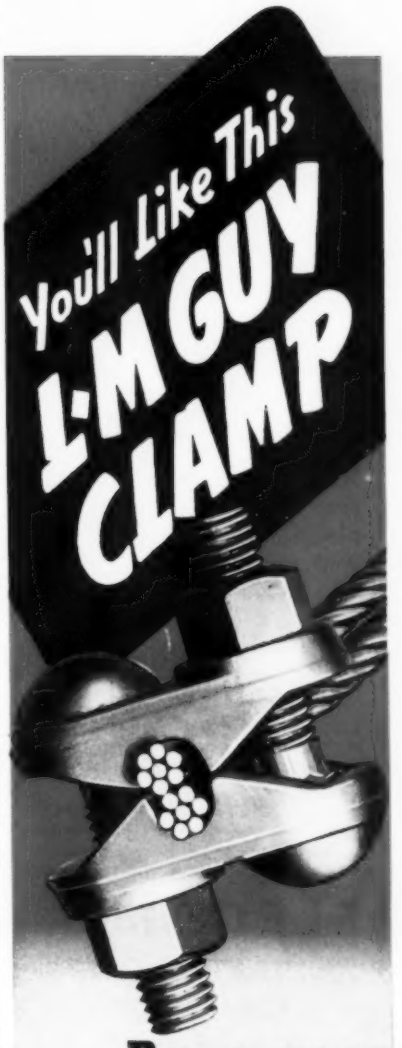
Since the question of copyright is one wholly for federal courts, it was not brought into issue in the lawsuit. The Lincoln company claimed that some of its advertisers had divided their directory appropriations, that the existence of two directories caused confusion and that errors in the duplicated directory interfered with prompt service. Witnesses pointed out more than 250 such errors.

Court Hears Nebraska Stock Controversy

The Nebraska Supreme Court has taken under advisement an action involving the question of whether a minority stockholder in a telephone company now serving the public has an absolute right to force dissolution of the corporation, to enjoin further continuance of the business and to appoint a receiver to liquidate its affairs, sell its assets and distribute the proceeds among stockholders.

The company involved, the Curtis & Southwestern Telephone Co. was one of four in Frontier county that united in forming the Curtis Telephone Co., to afford all of them exchange facilities. When the Southwestern's charter expired a new company was formed. A few of the stockholders insisted that the assets be sold, and refused to join in the organization of the new company. The trial court declared they had two choices: either accept stock in the new corporation or take the value of their stock as determined by the directors. It held:

"Where a case involves a public



Bolt ends of this L-M Universal Guy Clip point opposite directions . . . you can turn your wrench in a full circle, tighten it easier, faster. And stranded guy wires really stay put inside the long, non-slip groove. Try the L-M Universal Guy Clip . . . in ease of handling, reliability, long life, it's typical of the complete line of L-M Telephone Construction Specialties.

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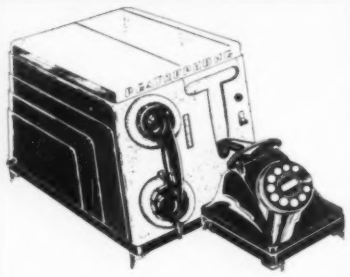

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service corporation which has been and is operating as a going concern, the court is of the opinion that it would be inequitable and prejudicial, not only to the interests of the stockholder as a whole and to the company, but to the public as well, to force a dissolution."

At the same session the court heard the appeal of Linden N. Elson from a judgment denying his claim that the directors of the Fox Creek Telephone Co., another one of the group, refused to sell stock in the Curtis company for $1,100 when he had offered $4,325 for it. The directors said that Elson was trying to capture control of the Curtis company, and that the Fox Creek company was bound under a contract to sell to one of the other three companies when it went out of business after its charter expired.

▼ ▼

Approve Trade of Exchanges in Oklahoma

A combined trade and sale transaction by which title and operation of the Catoosa (Okla.) telephone exchange is transferred from Edwin Schmidt to the Southwestern Bell Telephone Co., was approved by the Oklahoma Corporation Commission on April 10.

Mr. Schmidt gets the telephone exchange at Southwest City, Mo., and $1,558 in cash, subject also to the approval of the Missouri Public Service Commission.

The Catoosa exchange is immediately adjacent to the Southwestern Bell exchange area at Tulsa and testimony at the hearing was that better service could be secured through merger of the two properties.

▼ ▼

Court Upholds Rate Reduction Order

The Michigan Supreme Court has upheld an order of the state public service commission requiring the Michigan Bell Telephone Co. to reduce intrastate long distance rates by $500,000 a year and to refund accrued overcharges of $1,200,000. The decision also assumed the reasonableness of FCC interstate rates.

▼ ▼

Territory Invasion Suit to U. S. Court

The suit for damages brought by R. C. and L. A. Simpkins, operators of the National Telephone Co., against The Southwestern States Telephone Co., will come up for pre-trial in the United States district court at Oklahoma City, Okla., May 16 and for regular trial May 29.

The Simpkinses are seeking $6,000 actual damages and $5,000 exemplary damages for alleged invasion of their

COMING CONVENTIONS

United States Independent Telephone Association, Spring Conference, Hotel Stevens, Chicago, April 29 and 30.

Indiana Telephone Association, Claypool Hotel, Indianapolis, May 7 and 8.

Pennsylvania Independent Telephone Association, Penn Alto Hotel, Altoona, May 15, 16 and 17.

New York State Telephone Association, Hotel Jamestown, Jamestown, May 20 and 21. Golf day, May 19.

The Illinois Telephone Association, Hotel Pere Marquette, Peoria, May 28 and 29.

Wisconsin State Telephone Association, Loraine Hotel, Madison, June 4 and 5.

Washington Independent Telephone Association, Cascadian Hotel, Wenatchee, June 13 and 14.

Oregon Independent Telephone Association, Redmond, June 16.

California Independent Telephone Association, Miramar Hotel, Santa Monica, June 19 and 20.

Association of American Railroads, Telephone Section, Hotel Gibson, Cincinnati, Ohio, September 23, 24 and 25.

United States Independent Telephone Association, Hotel Stevens, Chicago, October 14, 15, 16 and 17.

Independent Pioneer Telephone Association, Hotel Stevens, Chicago, October 16.

XUM

Answers to Questions on Page 42

1. Please refer to preface for answer to this question.
2. "Rd" is a code used for "ringdown trunk."
3. Enter "R col" in the "Special Instruction" space on your ticket. If the charge is accepted, enter "Yes" in the "Accepted space," if not, enter "No."
4. No. Only charges on completed calls are subject to the federal tax.
5. No, unless you have reason to believe the notification was not heard.

territory in and around Jesse, Okla., by the Southwestern States company.

The case has been before the Oklahoma Corporation Commission, in the Oklahoma Supreme Court and in district courts for the past five years. The Simpkinses claim that they have continuously maintained a telephone exchange in Jesse since November, 1935, and that the Southwestern States company has invaded their territory by maintaining an exchange and toll lines in Jesse and vicinity. (TELEPHONY, Jan. 11, p. 34.)

▼ ▼

Telephone Companies Escape Harmful Legislation

The corporations committee of the Nebraska legislature on April 10 indefinitely postponed a bill introduced by Senator Bevins of Omaha forbidding utilities from making and collecting service charges, which would have included service connection charges by telephone companies.

The committee has also killed a bill setting up rules and regulations governing workmen compensation insurance operation, asked for by the state compensation court, but which was opposed by many employers and insurance companies. Among other things it would have put a ceiling on rates. It was argued by employers that in practical operation it would stop competition as to rates between companies.

The legislature passed without a dissenting vote a bill authorizing the state board of educational lands and funds to grant telephone companies rights of way across state school lands. This will make easier and more direct the routing of the transcontinental underground cable when the western part of the state, where most of the school lands are located, is reached.

Summary of Commission Hearings and Rulings

Federal Communications Commission

April 2: Indiana Bell Telephone Co. and Southern Bell Telephone & Telegraph Co. requested authority to supplement existing facilities between Evansville, Ind., and Henderson, Ky.

April 2: Application filed by Mountain States Telephone & Telegraph Co., requesting authority to supplement existing facilities between Cheyenne, Wyo., and Denver, Colo.

April 2: American Telephone & Telegraph Co. requested authority to supplement existing facilities between Stevens Point and Rhinelander, Wis.

April 2: Authority requested by New England Telephone & Telegraph Co. to supplement existing facilities between Lowell, Mass., and Nashua, N. H.; between Boston, Mass., and Plymouth, N. H.; and between Lancaster, N. H., and St. Johnsbury, Vt.

April 2: New York Telephone Co. and American Telephone & Telegraph Co. filed application for authority to supplement existing facilities between Elmira, Corning and Erwins, N. Y.

April 2: Southwestern Bell Telephone Co. requested authority to supplement its existing facilities in a portion of the section between Leavenworth and Kansas City, Kans.

April 10: Authorized American Telephone & Telegraph Co., the Illinois Bell Telephone Co. and the Northwestern Bell Telephone Co. to construct a cable between Wyanet, Ill., and Davenport, Iowa, at an estimated cost of $319,000.

May 5: Further hearing, at new federal building, Philadelphia, Pa., on application of the New Jersey Bell Telephone Co. for authority to acquire the capital stock of the Imperial Securities Co.

June 9: Hearing on citation by the commission of the American Telephone & Telegraph Co. and 21 associated Bell System companies, to show cause why there should not be a reduction in rates for long distance service by the companies.

California Railroad Commission

April 16: Application filed by Southern California Telephone Co. seeking authority to discontinue the Heber exchange and make El Centro exchange service and toll station service available to subscribers in the Heber exchange.

Illinois Commerce Commission

March 27: Authorized Illinois Allied Telephone Co. to issue $420,000 of bonds to replace $250,000 of bonds and $130,000 of first preferred stock outstanding; and also to provide $35,000 to take care of rehabilitation of the company's lines and cost of installing automatic exchanges in Dover, Lamoille and Ohio.

April 22: Hearing at Springfield in the matter of petition by H. E. Skinner et al for an order to require the Illinois Commercial Telephone Co. to restore telephone service, temporarily discontinued March 28, 1940, on certain lines south from Carterville.

April 23: Hearing at Springfield in the matter of proposed advances in

SOMETHING'S HAPPENED -INSIDE!

Yessir!—a long hit has just turned the score upside down! And that's just about what's happened to Burgess Twin-Six Telephone Batteries. Burgess research engineers "knocked one over the left field fence" in utilizing a revolutionary material as insulation against internal short circuits.

It's based on Goodyear Pliofilm—science's amazing material—acid-proof—air-tight—even vapor-tight! It completely changes all previous concepts of Twin-Six Telephone Battery construction—*and* it's *exclusive* with Burgess!

SEE FOR YOURSELF!

Skeptical? Let us send you, without charge, an actual Twin-Six Battery, cut away for your inspection. See for yourself what "Sealed-in-Pliofilm" means . . . how it sensationally improves the *new* Twin-Six . . . and test it right at your desk!

FIND OUT WHAT'S HAPPENED INSIDE— SEND COUPON TODAY!

BURGESS BATTERY COMPANY
FREEPORT, ILLINOIS

WE WANT TO KNOW what's happened inside. Please send the new Burgess Twin-Six Telephone Battery, cut away to show the "Sealed-in-Pliofilm" construction . . . and full information.

COMPANY NAME _____

ADDRESS _____

CITY _____ STATE _____

ATTENTION _____ POSITION _____

XUM

Theory and Application of Electrical Testing Instruments (Concluded)

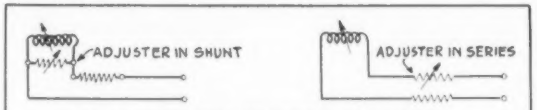

FIG. 29. TWO ZERO ADJUSTMENT METHODS.

In using any ohmmeter, first select the scale that will be most useful for the resistance involved, then short the test clips together and adjust scale to zero, and the meter will be ready for use.

Fig. 30 shows an ohmmeter that is ideal for all types of telephone testing work.

The Megger

The second type of instrument used in resistance measurements is the *megger*. This instrument is used primarily in measuring exceptionally high resistances—those in excess of 50,000 ohms up to several thousand megohms.

The megger is used principally by power and telephone companies for the measurement of insulation resistance. Because of the expense of this type of instrument, it has not been widely used.

The instrument consists essentially of a D.C. hand driven generator and a D'Arsonval movement containing a potential and current coil rigidly connected together and differentially wound. In operation the resistance to be measured is connected across the external terminals of the megger and the D.C. hand driven generator is turned. This causes a current proportional to the voltage generated by the D.C. generator to flow through the potential coils.

The current flowing through the potential coil is so poled as to cause this coil to move the indicator needle to the left hand side of the scale. The external resistance causes a current flow through the current coil so poled as to set up a flux opposing that created by the potential coil. This tends to move the indicator needle toward the right and it will come to rest at a

"Telephony's" Engineering Data

point where the two forces (due to the currents in the potential and current coils) are exactly balanced.

The scale is so calibrated that it indicates the amount of external resistance required to produce a given deflection. The megger is really a self-computing ohmmeter; i.e., it measures the voltage across and the current through the device whose resistance is being measured. Fig. 31 shows the circuit of a popular type of megger. Meggers are usually equipped with generators having slipping clutches so that the voltage generated is constant regardless of speed, provided the generator is revolved at a rate slightly in excess of normal. It should be noted, however, that the voltage of the generator does not affect the accuracy of the measurement, as any variation affects both potential and current coil to the same degree.

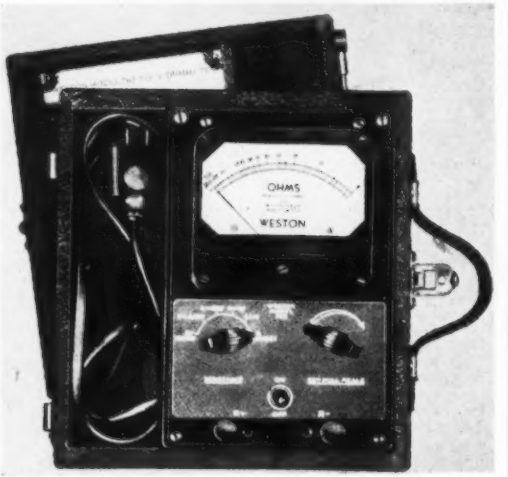

FIG. 30. SIX-RANGE OHMMETER IDEALLY SUITED FOR TELEPHONE TESTING.

"Telephony's" Engineering Data

The Wheatstone Bridge

The third form of resistance measuring instrument is the *Wheatstone bridge*. The Wheatstone bridge is primarily a resistance measuring instrument. However,

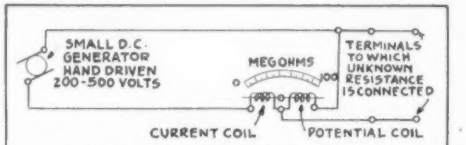

FIG. 31. CIRCUIT OF TYPICAL MEGGER.

it is especially well adapted to locating faults in telephone and power cables and open wire circuits.

Because of the number of keys and dials on the Wheatstone bridge, it is often considered a complicated and rather difficult instrument to use by those not familiar with its relatively simple circuits. If the fundamental principles of the Wheatstone bridge are understood, no difficulty will be experienced in its use, and anyone who can divide and multiply can successfully operate it.

For those interested in the detailed operation of the Wheatstone bridge as applied to telephone measurements, please refer to the complete series of data sheets on this subject beginning in the July 6, 1940 issue of TELEPHONY.

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rates for telephone service in Carrollton by the Illinois Telephone Co.

Kansas State Corporation Commission

April 21: Hearing on the application of Surburban Telephone Co. for permission to transfer its franchise and to cease operating as a public utility at Basehor and Tonganoxie; and on application of Foster Laming for certificate of convenience and authority to transact the business of a telephone utility at Tonganoxie and Basehor.

April 22: Hearing on application of Southwestern Bell Telephone Co. to file and put into effect a new schedule of rates at Scandia.

May 6: Hearing to be held on application of Western Light & Telephone Co. for authority to discontinue the central office at Milan and connect to Argonia exchange; and change Milan rates to rural subscriber rates of Argonia.

Missouri Public Service Commission

April 15: Issued order suspending for 30 days unless otherwise ordered the schedule of rates proposed by the Fidelity Telephone Exchanges at Sullivan.

April 16: Joint application filed by E. O. Turner and Alice Turner, requesting authority to sell, and A. L. Shopper and Clara M. Shopper, requesting authority to purchase, the telephone exchange at Rich Hill.

April 17: Approved application of United Telephone Co. for authority to file a schedule of rates for telephone service at Urich.

April 18: Approved the joint application of Southwestern Bell Telephone Co. for authority to sell, and United Telephone Co. for authority to pur-

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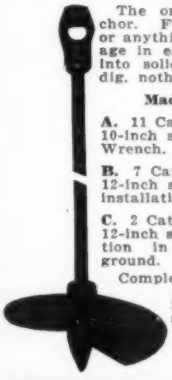

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Nebraska State Railway Commission

April 18: Application filed by Central Electric & Telephone Co. of Sioux City, Iowa, for authority to issue 100,000 shares of $2.50 preferred stock without par value and 100,000 shares of common stock with a par of $1.00, the proceeds to be used for retiring outstanding 6 per cent preferred stock and to acquire and improve properties.

April 19: At request of the applicant, the Central Electric & Telephone Co., commission dismissed its request for approval of an issue of 70,000 shares of 5 per cent cumulative preferred stock and reducing authorization of 725,000 shares of common stock of $1.00 per value to 400,000 shares without par value.

April 19: By agreement of parties the application of the Glenwood Telephone Co., for authority to extend its lines to two subscribers formerly served by the Kenesaw Telephone Co. of Kenesaw, was dismissed.

New York Public Service Commission

April 21: Hearing at Rochester in the proceeding by the commission to determine whether the Rochester Telephone Corp. should be compelled to extend its lines into territory now served by the Ogden Telephone Co.

April 24: Hearing at New York in the proceeding by the commission as to rates, etc., of the New York Telephone Co. in respect to service through private branch exchanges in hotels, apartment houses and clubs.

Ohio Public Utilities Commission

March 27: Ohio Standard Telephone Co. filed application seeking authority to increase rates at its Decatur, Georgetown and Russellville exchanges.

April 14: Application filed by Ohio Standard Telephone Co., asking increases in rates for service at Phillipsburg. The increases are:

Business independent line, raised from $2.00 to $3.50; business rural, $1.50 to $2.50; residence independent line, $1.50 to $2.25; residence four-party, $1.25 to $1.75; residence rural, $1.25 to $1.75.

Wisconsin Public Service Commission

April 22: Hearing at Madison on application of Kaukauna Telephone Co. for authority to increase rates.

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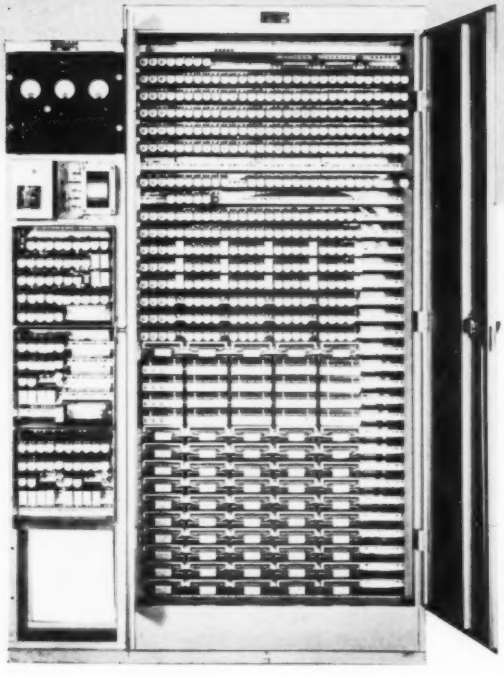

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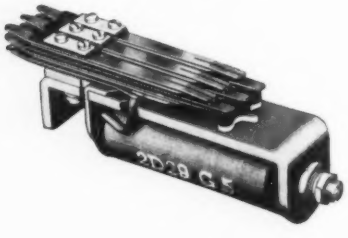

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